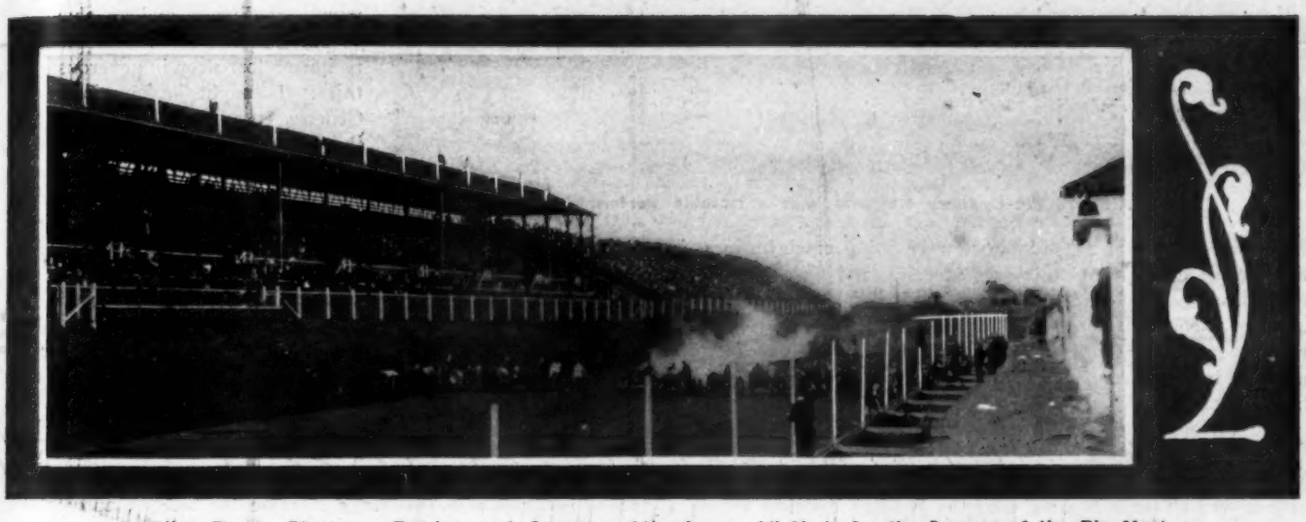
VOL. XXI NEW YORK—THURSDAY, NOVEMBER 18, 1909—CHICAGO No. 21

THE AUTOMOBILE



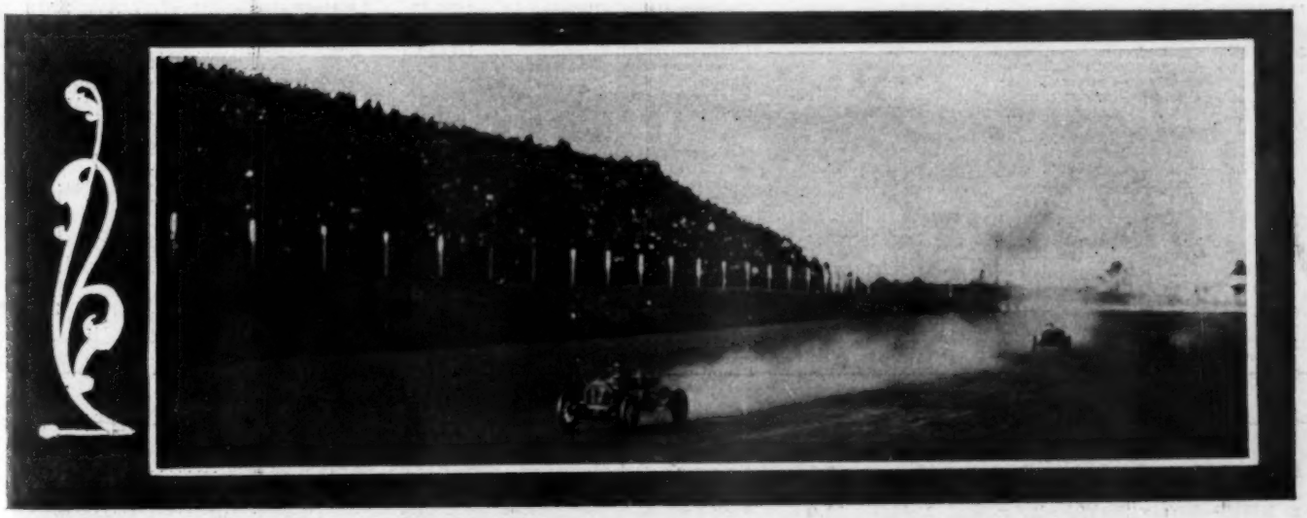
Wide Track, Plenteous Entries, and Generous Attendance, All Made for the Success of the Big Meet

ATLANTA AUTO WEEK AWAKES SOUTH

ATLANTA, GA., Nov. 13—The show is ended, the races are over, and the tourists are wending their varied homeward ways. Atlanta's automobile undertaking was crowned with gratifying success, and substantial results have come to the industry, to the buyer of cars, and to the man who enjoys speed contests, not forgetting the greater number who are interested in the building of roads so that they can more thoroughly enjoy the most economical and pleasurable necessity of the age.

It needed a National show to awaken in great degree the interest of the South, and this hustling city has met the requirements of the situation with commendable enterprise and a unanimity of effort which contained only minor mistakes. The first exhibition of 1910 cars in the new Auditorium-Armory attracted large attendance, though it is unquestionably a fact that a plethora of racing caused the out-of-town visitors to give the show less attention than would have been the case had there been less of the spectacular on tap to occupy their time.

To those who had never seen automobile contests, the events on the remarkable speedway presented a magnetism which could not be resisted, and even the old-timers enthused over some of the notable contests of the week. Managers Miles and Reeves expressed satisfaction when the reports began to reach the



Knipper's Chalmers-Detroit, Winner of One of the Important Events, in Full Flight

Aitken's Six-Cylinder National Was a Notable Performer

executive offices that the exhibitors were doing much business in the way of establishing Southern agencies, and also securing in many instances a considerable number of individual orders.

As to a National show in Atlanta another year, that question will have to be answered by the National Association of Automobile Manufacturers, when a summation of the entire exhibition is available.

The various tours into Atlanta from all over Georgia added immensely to the good roads campaign which is being vigorously pushed throughout the State. A thorough realization of this only comes through touring into the country districts where a frequent scene includes the stripe-suited convicts healthily digging away at Mother Earth, from which task they desist only long enough to importune the passing tourist for some change for the ever-needed tobacco. The New York-to-Atlanta tour of the New York *Herald* and Atlanta *Journal* set the ball a-rolling, and this was supplemented most successfully by the half-dozen runs into Atlanta, promoted under the auspices of the Atlanta *Constitution*. With the other Atlanta paper, the *Georgian*, an ardent advocate of convict labor on the roads, it is to be seen that the press of the city is united in its espousal of the automobile and the sequent building of highways.

During the week there have been numerous dinners and an abundance of entertaining, so much so that the recipients lost sleep in generous quantities. It might be mentioned that Georgia is a prohibition State, and the favorite beverage in Atlanta is Coca-Cola, the production of which supplied the basis of the Candler millions. That alcoholic nourishment was obtainable in Atlanta, however, was discovered in due course of time by those who sought such alleviation of thirst.

Of course, there were the usual first sales of cars, but no concern reported that its entire output has been sold at the show. This statement will be reserved, as in previous years, for the forthcoming exhibitions in New York City. All around it is the concensus of opinion that at this time the Atlanta show was more than worth while, and the resultant good will offset by a comfortable balance any expense to which the exhibitors were subjected in thus opening up a section of the country where good roads progress will materially increase the sale of automobiles.

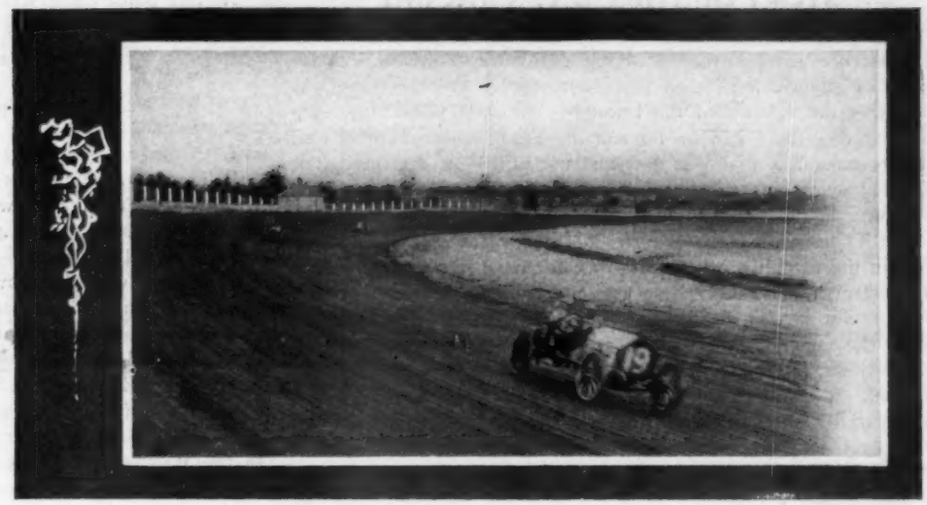
What the Racing Summary Shows—Medium-priced American stock cars have again demonstrated their marvelous speed capacity. No one would have imagined a few years ago that cars selling to every-day customers for from $1,500 to $3,000 could

CONDENSED SUMMARY OF THE ATLANTA SPEEDWAY RACES, NOVEMBER 9 TO 13, 1909

Distance	Winner	Time	M.P.H.	Second	Time	Third	Time
STOCK CHASSIS (451 TO 600 CUBIC INCHES)							
200 MILES	Rainier (Disbrow)	2:53:48	71.8	Fiat (Robertson)	2:57:47	Renault (Basle)	2:58:43
20 MILES	Fiat (Robertson)	17:47	67.4	National (Aitken)	18:22	Apperson (Harding)	18:23
10 MILES	National (Aitken)	8:27.22	71.0	National (Kincaid)	8:27.71	Apperson (Harding)	8:50.65
10 MILES	Apperson (Harding)	8:30.68	70.5	Stearns (Rutherford)	9:30.67	.....	.....
6 MILES	Fiat (Robertson)	4:43.37	76.0	National (Aitken)	5:11	Apperson (Harding)	5:13
STOCK CHASSIS (301 TO 450 CUBIC INCHES)							
200 MILES	Buick (Chevrolet)	2:46:48	72	Chalmers-Detroit (Dingley)	2:53:33	Chalmers-Detroit (Lorimer)	2:55:15
20 MILES	National (Aitken)	16:62.70	71.7	Marmon (Stillman)	16:46.86	Chalmers-Detroit (Lorimer)	16:49
12 MILES	National (Aitken)	10:07	71.0	Chalmers-Detroit (Lorimer)	10:09	Chalmers-Detroit (Dingley)	10:10.43
12 MILES	Buick (Chevrolet)	10:12	70.6	Chalmers-Detroit (Dingley)	10:28	Chalmers-Detroit (Lorimer)	10:37
STOCK CHASSIS (231 TO 300 CUBIC INCHES)							
120 MILES	Marmon (Harroun)	1:49:26	66.0	Chalmers-Detroit (Matson)	1:57:22	Renault (Basle)	2:09:15
STOCK CHASSIS (161 TO 230 CUBIC INCHES)							
100 MILES	Chalmers-Detroit (Knipper)	1:40:46	59.8	Chalmers-Detroit (Matson)	1:41:52	Buick (Nelson)	1:43:10
24 MILES	Chalmers-Detroit (Knipper)	23:40.42	60.8	Chalmers-Detroit (Matson)	23:40.71	.....	.....
10 MILES	Chalmers-Detroit (Matson)	9:49.46	61.2	Chalmers-Detroit (Knipper)	9:49.84	Buick (Nelson)	9:50.18
10 MILES	Chalmers-Detroit (Matson)	10:41.06	56.2	Chalmers-Detroit (Knipper)	.....	.....	.....
4 MILES	Chalmers-Detroit (Matson)	4:05.52	58.0	Chalmers-Detroit (Knipper)	4:08.42	.....	.....
FREE-FOR-ALL							
50 MILES	Fiat (Robertson)	40:14	70.8	National (Aitken)	43:11	Marmon (Stillman)	43:30
2 MILES	Fiat (Strang)	1:31.40	79.0	Benz (Oldfield)	1:37.18	National (Aitken)	1:43.70
2 MILES	Fiat (Strang)	1:37.18	75.0	Christie (Christie)	1:41.70	.....	.....
1 MILE	Fiat (Strang)	37.70	95.5	Benz (Oldfield)	40.13	Christie (Christie)	48.02
SPECIAL AND EXHIBITION							
10 MILES	Fiat (Strang)	7:27.04	80.3	Benz (Oldfield)	7:27.71	.....	.....
4 MILES	Fiat (Strang)	2:47.03	86.5	Christie (Christie)	3:10.41	.....	.....
2 MILES	Fiat (Strang)	1:21.51	89.0	Fiat (Strang)	1:22.07	.....	.....
FREE-FOR-ALL HANDICAPS							
20 MILES	Rainier (Disbrow)	19:51	60.4	Marmon (Harroun)	20:10	Marmon (Stillman)	20:23
10 MILES	Fiat (Robertson)	8:29.08	71.0	National (Aitken)	8:50.25	Marmon (Stillman)	8:50.53
10 MILES	Marmon (Stillman)	8:54.56	67.2	Marmon (Harroun)	9:05	National (Aitken)	9:12.41
8 MILES	National (Aitken)	7:42.70	62.5	Rainier (Disbrow)	7:48.03	Fiat (Robertson)	7:59.59
6 MILES	Marmon (Harroun)	5:40.83	63.3	Chalmers-Detroit (Knipper)	5:41.20	Chalmers-Detroit (Matson)	5:50.91
HANDICAPS (231 TO 300 CUBIC INCHES)							
10 MILES	Buick (A. Chevrolet)	9:03.18	66.2	Marmon (Harroun)	9:18.07	Chalmers-Detroit (Knipper)	9:18.09
10 MILES	Marmon (Harroun)	9:51.01	60.8	Chalmers-Detroit (Matson)	9:51.23	Chalmers-Detroit (Knipper)	9:51.27
HANDICAP, NEW YORK-ATLANTA RUN CARS							
20 MILES	Benz (Stoecker)	20:36	58.5	Matheson (Whalen)	21:15	Renault (Schaab)	21:55
AMATEUR							
24 MILES	Stearns (Rutherford)	20:35	70.0	Pope-Hartford (Kizer)	.....	.....	.....
10 MILES	Stearns (Rutherford)	8:42.60	70.4	Buick (Oldknow)	9:04	.....	.....
10 MILES	Buick (Oldknow)	8:52.56	67.6	Stearns (Rutherford)	8:52.57	.....	.....

be stripped, brought out on a track, and made to show 60 to 75 miles an hour for 2000 miles at a stretch. Admitting to the fullest degree that speed is not the only thing to be sought for in automobile construction, this remains at once a demonstration both of the power and the reliability, in the face of the hardest of usage, of the machines in question.

There can be no doubt, either, of the value of these races to the manufacturers who have consistently participated in them, from the engineering as well as from the advertising point of view. Their 1910 models may be expected to show the influence of the experience thus gained, not in ways patent to the casual observer, but nevertheless important in the final performance of the car.



As the Cars Rounded Upper Turn They Decreased Speed

The summary shows that in the largest class the National, Apperson and the Rainier each made away with one event, while the Fiat, which was driven by Robertson, took two. In addition National scored three second places, and Fiat one, while Apperson got three thirds. Disbrow's performance of 200 miles in 2.53:48 was creditable.

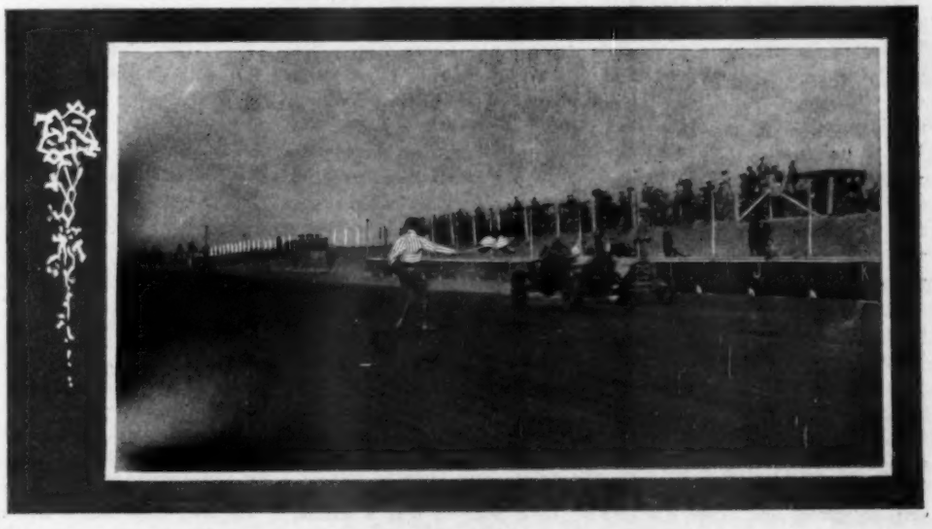
In the class for cars with a piston displacement of from 301 to 450 cubic inches displacement National and Buick split even, each with two victories. Chalmers-Detroit was the heaviest runner-up, garnering no less than three seconds and four thirds, which, scoring by points as a track-meet is scored, would put them ahead of the other two.

Marmon proved the leader in the 231-300 inches class, scoring two firsts to the Buick's one; it must be admitted, however, that in one of these, a handicap, the Marmon was given far too great a distance. Marmon also took one second, and Chalmers took two seconds and two thirds. The baby Chalmers had it all their own way in the smallest class, and the real racing was between Matson and Knipper. In this Knipper had the better of it, but only after several of the hottest kind of races. Nelson squeezed his Buick in for two thirds.

In the free-for-alls Strang and his big Fiat had it all their own way, at least on the shorter distances. Barney Oldfield, who has often found easy picking with his Benz Grand Prix racer, had to admit himself outclassed. It was a case of "defeated, but not dishonored," for the relative powers of the two machines left no doubt as to the outcome. Incidentally, Michelin tires scored a goodly percentage of victories.

The twenty-mile handicap for New York-Atlanta tourists was a particularly interesting event, for it showed the possibilities of cars which were "stock" in the strictest sense of the word. All of these machines had of course to be geared low enough to take the hills and bad roads met with on the way, but nevertheless Stoecker drove his Benz over the twenty miles in 20:32, close to mile-a-minute speed.

Especially Well Equipped Were the Pits for Rapid Work



Harroun's Marmon Demonstrated Its Ability Repeatedly

STORY OF THURSDAY'S RACING

ATLANTA, GA., Nov. 11—If, as the dictionary alleges, "recrudescence" means the "breaking out after temporary abatement or suppression," then the recrudescence of Robertson was certainly the feature of the Speedway races on Thursday. Up to that day there can be no denying that Robertson was well suppressed. His Fiat was new and not tuned up, and though it showed symptoms of speed, it never really broke out with it all over.

But Thursday Robertson arrived—twice in fact. The first time was in the 10-mile stock chassis race for cars of 600 cubic inches displacement or under. Five cars started in this and four finished. But it was all Robertson. He was away first and finished the same, some three-quarters of a mile or more ahead of Jack Aitken in the No. 3 National, of lesser horsepower it should be said. Robertson came again in the 10-mile handicap, in which he figured as the scratch quantity. The handicaps were a joke to Robertson, though he was some time in demonstrating it.

The day's card opened with the long race, a 120-mile stock chassis affair, 231 to 300 cubic inches piston displacement, for the Atlanta Automobile Association trophy and some additional trinkets in the way of 1,050 gold dollars divided into three prizes.

According to a careful reading of the form charts Chevrolet was a certain winner over a field made up of Ray Harroun in a Marmon, Joe Matson in a Chalmers-Detroit, and Charley Basle in a Renault. The Buick ran for a good two dozen miles, opening up an awful lead. Then something went wrong with a valve. Chevrolet stopped on a turn and tinkered awhile, and then came back to the pits and tinkered some more. Then he tinkered a little while longer, and then he ran some. Finally he drew up in front of the pit and with the assistance of a hammer demolished much of the top of one cylinder, whittled out a wooden plug to fill the resulting hole, hammered it in and went on after third money.

By that time the Marmon had a defeat-proof lead and the Chalmers was second, but the Renault was no very excellent third, and the Buick, running on three legs, went after it. It was a game chase, and one that had the pit men cheering and shouting; but, though Chevrolet could pick up 10 seconds to a lap, he could not overhaul the Frenchman and his French car, and Basle finished third, taking the first money of what has been an unlucky meet for him. Whereupon he bought a bottle of lemon soda and a bag of chocolate creams, and, sitting in the shade of a pit wall, celebrated copiously.

The winning Marmon made the 120 miles in 109:26:94. Of course, there was no Indianapolis record to check this against, but when Harroun finished his one-hundredth mile he was 1 minute 33 seconds ahead of his Indianapolis time for that distance.

The second race run was a 20-mile handicap, which was one wild, grand scramble, a veritable motor melée, in which L. A. Disbrow's Ranier proved the best scrambler. There was a desperately narrow escape as the cars were lining up. The Matheson, which was slated to make its Atlanta début in the race, was the last car to come down to the line, and it came with a rush. Neil Whalen tried to put on the brake when the line was nearly reached, but it did not stay put. Whalen yanked his car one way and then the other, slowing it down by the skidding method, and finally headed for a very narrow hole between the pit fence and the inside car of the machines lined up. In this opening were two useful officials, one of which jumped one way and the other the other, just in time to escape the big six-cylinder, which reeled through the opening and out safely on the other side. Before the car was well stopped Starter Wagner and Referee Pardington hove alongside, and began telling Whalen just what sort of a driver they thought he was, which, being completed, they sent him back to the garage to repair his brake, starting the race without him.

A 10-mile event open to amateurs for the Southern championship followed, and John Rutherford in a Stearns was a winner by a safe margin.

At this point there was an "extra." Strang's 200-horsepower Fiat was driven on the track, and with it was the original Haynes runabout, with Elwood Haynes in the driver's seat and Asa Candler, Jr., beside him. The two cars were driven down in front of the judges' stand, photographed, and then the Haynes was driven off the track while Strang went an exhibition two miles from a flying start in 1:21:51.

In event 13, which was next, another Indianapolis (and likewise American) record was demolished. This race was at 20 miles for cars of 301 to 450 displacement and a field of a half dozen faced the starter. For the first lap the ones you could have covered with the proverbial blanket were the two Nationals, a Marmon, and Dingley's Chalmers-Detroit, in the order named. At the end of the next lap it was the same, except that Dingley's Chalmers had nosed out Lorimer. The next laps the two National changed places and the Chalmers cars likewise "swapped." On the fourth time around the Kincaid National went out of business, but Aitken's car continued steadily in the lead, except in the fourteenth mile, when Lorimer made his last desperate drive and for a few seconds led the procession. In that one lap he shot his bolt and dropped back to third, while Harry Stillman's Marmon worked up into second place and stayed there until the end.

It was a grand race. For mile after mile the three or four leaders were separated by inches only, and the crowd, demonstrative always, was wild in its enthusiasm.

The only other event not already described was the seventeenth, a 4-mile stock chassis affair, for cars of 161 to 230 cubic inches displacement. In this race the two little Chalmers finished "one-two," with Joe Nelson in a Buick third and an E-M-F fourth. The time was 4:05:52. Summary:

120-MILE STOCK CHASSIS (231 to 300 Cubic Inches)

First Prize, Atlanta Auto Association Trophy and $600 in Gold; Second Prize, $300 in gold; Third Prize, $150 in Gold.

1	Marmon	Harroun	1:49:26.94
2	Chalmers-Detroit	Matson	1:57:22.92
3	Renault	Basle	2:09:15.20

20-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

First Prize, Cup; Second Prize, Cup.

1	National	Aitken	16:42.76
2	Marmon	Stillman	16:46.86
3	Chalmers-Detroit	Lorimer	16:49.63

The winner's time is a new competition record.

10-MILE STOCK CHASSIS (600 Cubic Inches or Under)

First Prize, $100; Second Prize, $50.

1	Fiat	Robertson	7:47.71
2	National	Aitken	8:22.87
3	Apperson	Harding	8:23.17

10-MILE STOCK CHASSIS (Amateur Drivers Only for Southern Championship)

First Prize, Cup; Second Prize, Cup.

1	Stearns	Rutherford	8:42.63
2	Buick	Oldknow	9:04.17

4-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

First Prize, Cup; Second Prize, Cup.

1	Chalmers-Detroit	Matson	4:05.52
2	Chalmers-Detroit	Knipper	4:08.42

20-MILE FREE-FOR-ALL—HANDICAP

First Prize, $150; Second Prize, $50.

1	Rainier	Disbrow	(2¾ min.)	19:51.15
2	Marmon	Harroun	(2½ min.)	20:10.63
3	Marmon	Stillman	(2 min.)	20:23.41

10-MILE FREE-FOR-ALL—HANDICAP

First Prize, $150; Second Prize, $50.

1	Fiat	Robertson	(scratch)	8:39.08
2	National	Aitken	(32 sec.)	8:50.25
3	Marmon	Stillman	(32 sec.)	8:50.53

2-MILE EXHIBITION

Fiat	Strang	1:21.51

THE EVENTS OF FRIDAY

ATLANTA, GA., Nov. 12—The Atlanta Speedway has had luck in its weather, in its entries and in a score of ways, but Friday there were horseshoes and rabbits' feet pinned all over the track. From the start of the meet any car could smash a steering knuckle, blow out a tire or lose a wheel going at absolutely top speed and not a soul would be even scratched.

But on Friday there were two accidents, either of which was calculated to kill a man or two, and yet, barring a scratched face, not a person suffered.

The first and most sensational accident happened in the morning—an accident that marked the passing of "The Merry Widow," the big Pope-Toledo racing car of ill repute and worse manners, which Asa Candler, Jr., president of the Atlanta Automobile Association, bought for use in the local races.

This car had showed its real class on the first day of the local races by back-firing when Louis Cliquot, its driver, was cranking and thereby fracturing his arm in three places. The car was then given over to Charlie Basle, who tinkered with it for a day, and then passed it on politely, but firmly, to Kilpatrick, who had come to Atlanta to drive a Hotchkiss, which went wrong and left him temporarily without an occupation.

Kilpatrick almost got the evil old craft in running order. He tinkered with it and nursed it along, and in the early hours of Friday's practice the old boat was running passably well. Then came the accident. Going at a good rate of speed the car rounded the first turn in good order and started into the second. As it did so the engine blew up. What gave way nobody knows, but a piece of steel from the engine went hurtling into the air, carrying the hood with it, and in a second the machine was beating itself to pieces and reeling up the track. At the head of the backstretch the "Merry Widow" headed for the outer rail, where there was a drop of 20 feet to the ground below. The fence straightened it out and it reeled back into the track, gave way all at once, threw the driver and mechanician high in the air and over the bank, turned a somersault, rolled over a couple of times, exploded mildly and then burned fiercely.

The miracle was that neither driver nor mechanician was hurt. It was only a matter of pacing to prove that both men were hurled nearly 60 feet from where the car threw them and that the drop from the track level to the ground below was 20 feet. And yet both men sailed this distance through the air and landed safely and with no damage done. The mechanician was not even scratched or jarred. Kilpatrick was slightly burned, but not otherwise hurt.

The "Merry Widow" burned fiercely, and it was nearly an hour before the flames could be sufficiently checked so that the wreck could be hauled off the track.

Strang, in his 200-horsepower Fiat, was the hero of another miracle. In the 50-mile free-for-all, while going at a good 80 miles an hour, the tread of his right rear tire came off. He shut off, slapped on the brakes, and managed to slow down his car to a moderate gait before the inevitable blow-out came.

The next accident, and the last one of the meeting, came later on in the 50-mile race. The two big Chalmers had kept the Apperson "Jack Rabbit" pretty well pocketed for a couple of laps, when Harding, in the last-named car, took a long chance. Motioning that he was coming between the two cars he slipped through a narrow opening and went out in front. His lead was short lived. As his car finished the first turn the right rear tire threw its tread; and Harding, foreseeing a blow-out, turned sharply into the inner rail. As he did his car skidded and the rear wheels went into the front of the Chalmers-Detroit driven by Lorimer. Both cars spun dizzily, smashed up a trifle, and came to rest without capsizing. Not a man was thrown from his car and the damage to the machines was so slight that the "Jack Rabbit" was running the next day, and the Chalmers could have been if it had been necessary.

Owing to the extreme length of the meet the fourth day's racing was notable largely for the small fields. There was really only one good race, and that was the 50-mile free-for-all.

If Louis Strang could have kept tires under his 200-horsepower craft there would have been nothing to it. He made the first 10 miles of the race in 7:18:21, which was way under the Indianapolis record for that distance. Then came the blow-out Strang retired, well knowing that his machine was not cut out for 50-mile performances on a track.

Then the race became a picnic for Robertson's stock "60" Fiat. Aitken's "40" National was always second, after Strang dropped out, and Stillman's Marmon came in a good third, pulling up from nowhere by steady work. The time of the winner was 40:14.02, which was well below the Indianapolis record of 44:31.2. In fact, the first four cars which finished were below the Indianapolis mark.

None of the other races was sensational. In Event 20 the only starters were two Chalmers, driven by Knipper and Matson, who circulated around the track in slow time. Event 21 was another picnic for Robertson and the Fiat. It was at 6 miles, and he romped home in 4:43:37 with Jack Aitken in the No. 3 National second and the Apperson third.

Aitken was the winner in the event for the 301 to 450 class at 12 miles in 10:07.65. It was not any runaway, however, for Dingley, in one of the Chalmers, gave stern chase and led on the fourth and fifth laps, only to be nosed out by a margin of less than two seconds.

The two-mile free-for-all, which was changed from a two-heats-in-three to a one-heat affair, was easy for Strang and the big Fiat. Robertson in the smaller Fiat made great time on the turns and seemed to have second place cinched, but Walter Christie, who had to take it easy on the turns, came down the stretch faster than ever car had done before and took second money.

The handicap, limited to contestants in the tours to Atlanta, was won by a Benz, driven by Ernest Stoecker. Summary:

24-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

First Prize, $100; Second Prize, $50.

Pos.	Car	Driver	Time
1	Chalmers-Detroit	Knipper	23:40.42
2	Chalmers-Detroit	Matson	23:40.77

24-MILE STOCK CHASSIS (Amateur Drivers)

First Prize, Kriegshaber Trophy.

1	Stearns	Rutherford	20:35.25
2	Pope-Hartford.	Kiser	

12-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

First Prize, Cup; Second Prize, Cup.

1	National	Aitken	10:07.65
2	Chalmers-Detroit	Dingley	10:09.25
3	Chalmers-Detroit	Lorimer	10:10.45

6-MILE STOCK CHASSIS (451 to 600 Cubic Inches)

First Prize, Cup; Second Prize, Cup.

1	Fiat	Robertson	4:43.37
2	National	Aitken	5:11.11
3	Apperson	Harding	5:13.02

20-MILE HANDICAP (New York to Atlanta Run Cars)

First Prize, Cup; Second Prize, Cup.

1	Benz	Stoecker	20:36.86
2	Matheson	Whalen	21:15.60
3	Renault	Shaab	21:55.83

10-MILE HANDICAP (231 to 300 Cubic Inches)

First Prize, Cup; Second Prize, Cup.

1	Marmon	Harroun	9:51.01
2	Chalmers-Detroit	Matson	9:51.23

50-MILE FREE-FOR-ALL

First Prize, $500; Second Prize, $250; Third Prize, $100.

1	Fiat	Robertson	40:14.02
2	National	Aitken	43:11.41
3	Marmon	Stillman	43:30.56

2-MILE FREE-FOR-ALL

First Prize, $200; Second Prize, $100; Third Prize, 50.

1	Fiat	Strang	1:34.47
2	Christie	Christie	1:41.71
3	Fiat	Robertson	1:42.30

SATURDAY'S CONCLUSION RATHER MILD

ATLANTA, GA., Nov. 13—If it had not been for the 200-mile race for big cars the officials would have been hard put to it to scrape up enough entries to-day to keep things under way. Four days of hard, even if lucky, racing had put a few drivers and more cars temporarily out of the running. However, a good field was patched and scraped up for the long event, and the contest was not without spectacular features. It proved a revival of the good old tale of the hare and the tortoise, with the Rainier car, driven by Disbrow, in the rôle of the tortoise.

The Rainier, except for the winning of a handicap, had not had any luck. But in the 200-mile race for the wonderful City of

Past and Present.
1893 Haynes and 1908 Fiat.

Stillman, the Marmonite

Chalmerites: Lorimer, Knipper, Dingley and Matson.

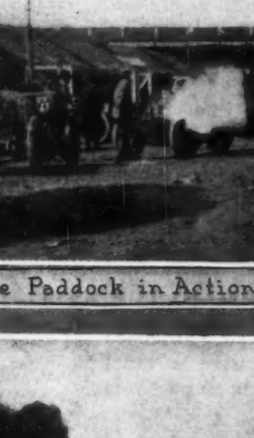
The Paddock in Action.

Speed Merchants:
Robertson.
Christie.
Strang
Oldfield.

Finish of Asa Candler Junior's Speed Craft

Chevrolet, daredevil;
Asa Candler, Sr., capitalist.

"Ned" Broadwell and Referee Pardington.



Robertson Indulges in Coco Cola.

Timekeeper C. H. Warner.

Atlanta trophy and $1,000 in gold it was the easiest kind of a winner. And, incidentally, the two Renaults, which finished third and fourth, both broke out of the non-winner class in the greatest event of the week. These cars ran through the 200 miles, with only one stop, and that for oil. The Rainier even bettered this. Not once in all the long grind did it hesitate, not a single time did it stop for repairs or supplies.

An even eleven cars started in the race—practically all the high powered machines that were in commission at the track. There were Robertson and Strang in stock Fiats; the Basle brothers in Renaults; Matson and Dingley in Chalmers-Detroits; the winning Rainier, the Apperson "Jack Rabbit," Stillman and Harroun in Marmons, and Chevrolet in a Buick.

In the natural course of events Robertson was the favorite. His Fiat was working marvelously, and if it could have kept going would have had the race won. All the heavy betting was on him. For 163 miles he was the leader of the race. This wily driver well knew that this race was not altogether with the swift. So he put a good lead to his credit, and then tacked to Disbrow's Rainier and hung on like grim death, accepting pace though his car had all the advantage in speed.

Then came the accident that caused the trouble. Whirling into the last turn his chain gave way. It was only the matter of a couple of links, but it cost him a half dozen laps and the race.

Two other prominent early contenders were Strang in his Fiat 60 and Chevrolet in a Buick. Strang was in the hunt for 28 laps, and then a series of mishaps which ended in the breaking of an oil pump case caused him to withdraw. Chevrolet made an even more brilliant race of it. For 42 laps his machine ran like an eight-day clock. Then the transmissions gave down in a heap; and, from a second-place position to a wreck at the pits, was the sudden transformation of his car.

The Chalmers team were good at the start, Dingley in particular staying well ahead of the ruck. But five days of hard racing had told on the cars, and both were eliminated before the race was well begun.

It took about 65 laps to get the race shaken down to a standing where even the experts could get a line on the finish. A broken spring put the Apperson out at about that point, and the Fiat of Strang had been driven slowly over to the garage and the five cars which were to finish were the only ones running. At that point Robertson was in the lead; the Rainier, which had pulled up from a chronic fifth, was second; and Charley Basle in his red Renault was third, with his brother in another Renault fourth. These two French machines had hung around the tail end of the procession when speed alone counted, but had pulled up when the reliability test had been applied.

Up to the 81st lap and nearly the end of the 82d the race has been a grind, with Robertson apparently the winner. Then came the accident to the chain and the race took a new aspect. The delay had killed Robertson's chances, but when he got under way again he was in third place and he set off like the wind to gain what distance he could. It took him 24 miles of furious driving to overtake Charley Basle and gain second place, and then he set off after Disbrow. It was a hopeless task, however. His only chance was that the Rainier pilot would have to stop, if only for a few seconds. So he took the chance and drove like mad. But never once hesitated the Rainier. As it had run at the start, it was running at the finish steadily and well. And it crossed the line a winner in 2:53:48.32. This broke the record of 3:24:13.4 made in Indianapolis; and, in fact, all four prize winners were comfortably under the Indianapolis record. The only other car that finished was Harroun's Marmon. It had no earthly chance and was dozens of miles back, but Harroun hung on in the hope that enough cars would drop out to put him in the prize money. But he missed being "placed" by just one position, finishing fifth.

The other races of the day were mediocre, owing to small fields and the fact that frequent clashes between all the cars had given the spectators a pretty good idea of how every race was to come out before it was even started. One of the few real contests was in the ten-mile event for cars of 231 to 300 cubic inches displacement. This was a see-saw affair in which the Buick, driven by A. Chevrolet, scratched up from third place to first and the Marmon, driven by Harroun, worked up from fourth to second, dropping a couple of Chalmers out of the prize money in consequence. The twelve-mile race for the 301 to 450 class was a procession with Chevrolet always leading, but the eight mile free-for-all handicap furnished a better contest. Aitken in his National was a winner, though at least three cars made it interesting for him.

The races closed with the long event and after it ended the crowds dispersed, not to assemble again until next Spring, when another meet is to be held. It is estimated that over 100,000 people attended the races and they proved a vast financial success. The $100,000 insurance that the Atlanta Automobile Association took with Lloyds against rain proved unnecessary, for barring a sprinkle on Wednesday the weather was beyond human criticism. Here is the summary of the last day's racing:

200-MILE STOCK CHASSIS (451 to 600 Cubic Inches)

First Prize, City of Atlanta Trophy (Which Must Be Won Three Times to Become the Property of the Entrant) and $1,000 in Gold; Second Prize, $500 in Gold; Third Prize, $300 in Gold; Fourth Prize, $200 in Gold.

Pos.	Car	Driver	Time
1	Rainier	Disbrow	2:53:48.32
2	Fiat	Robertson	2:57:47.05
3	Renault	C. L. Basle	2:58:43.93
4	Renault	L. Basle	3:13:41.87

12-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

First Prize, $100; Second Prize, $50.

1	Buick	L. Chevrolet	10:12.66
2	Chalmers-Detroit	Dingley	10:28.83
3	Chalmers-Detroit	Lorimer	10:37.76

10-MILE STOCK CHASSIS (231 to 300 Cubic Inches)—HANDICAP

First Prize, $100; Second Prize, $50.

1	Buick	A. Chevrolet	9:03.18
2	Marmon	Harroun	9:10.07
3	Chalmers-Detroit	Knipper	9:18.09

10-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

First Prize, Cup; Second Prize, Cup.

1	Chalmers-Detroit	Knipper	10:41.06
2	Chalmers-Detroit	Matson	13:35.73

6-MILE STOCK CHASSIS (231 to 300 Cubic Inches)—HANDICAP

First Prize, Cup; Second Prize, Cup.

1	Marmon	Harroun	5:40.83
2	Chalmers-Detroit	Knipper	5:41
3	Chalmers-Detroit	Matson	

8-MILE FREE-FOR-ALL—HANDICAP

First Prize, Cup; Second Prize, Cup.

1	National	Aitken	7:42.73
2	Rainier	Disbrow	7:48.63
3	Fiat	Robertson	7:59.50

2-MILE EXHIBITION

Fiat	Strang	1:22.07

METZ CAR IN 24-HOUR ENDURANCE RUN

WALTHAM, MASS., Nov. 13—The makers of the Metz car, which is usually sold unassembled, the parts being put together by the purchaser, gave one of their machines a strenuous reliability test recently. The run was over a five-mile course in the vicinity of Waltham, of which Glenn Curtiss in his motorcycle days once said: "For a speed contest this course is about the limit; but for an endurance run it's a dandy."

The car started at 5:45 P. M. One hundred miles were completed at 10:24; 200 at 6:19 A. M.; 300 at 11:07; 400 at 2:56 P. M., and 460 at 5:34. The gasoline consumption was 13 gallons 1 quart, and the oil consumption 6 quarts 1 pint.

The car ran with great regularity, making round after round without a stop. The only incidents were a puncture and the removal of some cotton waste which got into the inlet pipe.

Zengle's Narrow Escape—Len Zengle, who is now with the Pennsylvania factory at Bryn Mawr, Pa., was testing a racer last Saturday afternoon when a large touring car filled with women loomed up ahead. He deliberately steered his car up a high bank, hoping to dodge the trees, but one caught the Pennsylvania on the middle of the radiator. Zengle landed on a pile of leaves unscratched.

FRANCE FINDS NEW RULES OF THE ROAD IMPERATIVE

PARIS, Nov. 12—In addition to the international automobile regulations which have recently been studied in Paris, France is interested in bringing up to date her national laws governing traffic. The present set of regulations was drawn up in 1851, at a time, naturally, when automobiles were unknown, and when traffic was not as intense as to-day. Admittedly the laws need modernizing, and in order that this work should be done properly Louis Barthou, then Minister of Public Works, appointed a commission of experts, representing the automobile industry, road makers, horse owners, cyclists and the ministries of justice and public works, to draw up an ideal road code, which should be presented to the Minister of Public Works, and by him brought before the government for presentation to parliament.

The experts met last June, then again this month. In the meantime they had gathered together, in a classified form, all the road regulations of all countries. From this mass of regulations, some good, some bad and many indifferent, the experts will pick out the best and with them create an ideal set of laws governing traffic. Although the automobile men occupy a prominent position on the commission, the intention is to study the question from an even broader standpoint than that of motorists. The interest of all parties have to be considered from the standpoint of the foot passenger, the horse owner, the automobilist, and dwellers along the roadside. In addition the road builder will be consulted.

The commission is now in two sections, one of them studying the road itself, and dealing principally with the weights of vehicles that shall be allowed on the road, the type of wheels they shall employ, etc. The other section has the larger problem of creating laws for the regulating of traffic. It is very probable that the new code will adopt a free speed limit. At present official France is in contradiction with itself, for it has a maximum speed law of 18 miles an hour, which if rigorously applied would put every French automobilist into prison. Practically no limit is imposed, but there is always danger of an attacking party taking advantage of the legal limitation. What will doubtless be done will be to make the law as reasonable as its present application, which is no limit, but every man responsible for the accidents he may cause. This will also put a check on the mayors of little villages, who at present have the power to fix local speed limits varying from a walking pace to 10 miles an hour—but rarely have the courage to enforce them.

Lights on all vehicles will be a strong point of the new code. Where the maximum speed is less than 18 miles an hour, only one light will be required, but it must be of such a nature and placed in such a position that it will be seen as clearly from behind as from the front. Cattle and sheep driven on the road at night will have to show a light in a similar way, and it is more than probable that the same regulation will apply to troops and any considerable body of men marching together.

Another proposed improvement is that all cases of dispute between any stranger and a native shall not be tried before the local courts, but in the chief town of the department, corresponding to the capital of the State in America. Almost invariably in a dispute between an automobilist and another person the automobilist is a stranger to the district, or probably a foreigner, while his opponent is a native. The local judge has such strong local attachments that it is rare indeed that the stranger receives fair treatment. It is but natural that in case of a doubt the local judge should decide in favor of his townsman rather than of a stranger he has never seen and may never see again. At times, too, the automobile brings exceedingly important cases before exceedingly unimportant courts, the judge of which has not the experience necessary to arrive at a just decision. The transference of all such cases to the capital town would not cause much inconvenience to the natives and would assure fairer treatment to the automobilist.

Indications are that the new code will become law at an early date. Automobile touring in France has become so widespread, traffic is so great on all the main highways, that it is impossible to continue with a set of regulations brought into existence over forty years ago. What is needed is a set of regulations that will clearly define the duties and responsibilities of all users, that will make it impossible for the dare-devil chauffeur to endanger the lives of others, and equally impossible for the farm laborer to sleep in the bottom of his cart while his team wanders along at its sweet will. The highway has come to life and must have rules and regulations as clearly defined as those of the railway—and as rigorously enforced.

PRESIDENT TAFT O. K.'S THE SAVANNAH COURSE

SAVANNAH, GA., Nov. 13—President Taft, during his recent visit, gained the honor of being the first president of the United States to enjoy a ride around an automobile race course. He much enjoyed his circuit of the twenty-five-mile course on which took place the greatest automobile contest that was ever held. President Taft was greatly pleased with the reception in Savannah, and the ride was the best he ever had. When asked what he thought of the course, the President said: "This is the finest course that I have ever laid eyes upon, and you shouldn't let it be idle. Why, if we had it in Washington, we would have Grand Prize races every six months."

President Taft in Mayor Tiedeman's Packard "30"

The picture shows President Taft, Mayor George Tiedeman and Capt. Archibald W. Butts, in the rear seat, while James Sloan, Jr., the secret service man, occupies the front seat with the driver. The picture was taken in front of General W. W. Gordon's residence, where the President stopped. The car was the Packard "30" of Mayor Tiedeman.

NEW YORK "COPS" FOUND TOO FRIENDLY

Police Commissioner Baker of New York has decided that the bicycle policemen are getting too friendly with the chauffeurs who customarily pass on their beats. The "cops," it is said, are not averse to accepting an occasional ride, and in return look the other way when their acquaintances go by at a twenty-mile clip. As a result wholesale transfers have been made.

President Battey "At Home" Tourists Leaving Louisville, Georgia, After the Prolonged Stop

HOW SAVANNAHIANS TOURED ACROSS GEORGIA TO ATLANTA

SAVANNAH, GA., Nov. 13—With thirty cars participating, the first endurance run from Savannah to Atlanta started from the DeSoto hotel on the morning of November 8 at 6.45 o'clock. As each car left a cheer was given, for more than five hundred saw the tourists begin their journey.

While traveling at forty miles an hour, Harvey Granger's big "6" Stevens-Duryea ran into a stump some nine miles out of Savannah, and had its front somewhat dented. Luckily for those in the car, it was thrown against a telegraph pole which kept it from capsizing.

The first greeting was received just after passing out of Chatham county, and it came from the road-making convicts. Brooklet was the first stop, and here hung a banner with the words: "Welcome to Brooklet." The next sign read "Burke County Line," and from here on the roads were so good that the cars arrived at Louisville two and a half hours ahead of schedule time. DeBorde's Buick lost two of its wheels near Waynesboro as a result of trying to get out of the way of a horse and wagon. Slight bruises came to the car's occupants, who were well enough to continue the trip after new wheels had been received from Savannah.

At Louisville, the former home of President Battey, a big dinner was awaiting the tourists, who were the guests of his old townsmen. The feast was bounteous and unique and the tourists found it hard to leave the fair ones who had served them so gracefully.

At Waynesboro came more luncheon, and again the contestants had no use for their money. At Sandersville the same treatment was repeated.

When about twenty-five miles out of Statesboro, Mayor Tiedeman was thrown from his Packard, and broke one of his fingers, besides sustaining a wrenched back. His finger was dressed by N. H. Van Sicklen, and he continued the trip.

When Milledgeville, the night stop, was reached, it was found that fifteen cars of the thirty had managed to keep in the front and check in.

All of the cars that checked in and those that broke down on the road and caught up after running all night, left Milledgeville the next morning at 8 o'clock. The send-off was one of the greatest the town had ever given to anybody. The cadets at the military school were drawn up in companies, and saluted as the contestants passed. On the steps of the old capitol where the ordinance of secession was passed, several hundred young ladies stood and waved American flags. When the cars passed the girls' normal school, the girls, who numbered way into the hundreds, stood in line and cheered each car as it went by.

Eatonton had a large banner carrying the words: "Welcome to Eatonton," which place was reached at 9.15. The sign "Newton County Greets You" introduced some of the best roads that had yet been passed over, and here the same "glad hand" was again extended.

Of the whole trip the best reception was received at Covington. The streets were roped off so as to allow the automobilists to go through to the place prepared for them at the court house, where dinner was served by a committee of young girls. The boys from Emory college also took part and gave a few college yells. While leaving Covington a slight accident happened. An E-M-F, driven by Adkins, ran into a Buick, driven by Youmans, and both cars suffered somewhat. A blacksmith was near at hand and soon had the cars running. The stay at Covington was stretched from forty minutes to 1 hour 55 minutes.

When it was heard that the party had reached Stone Mountain, a reception committee in three cars, headed by R. V. Connerat, met the party just below Decatur, in which were J. W. Hill, of Atlanta; Judge A. B. Moore, of Savannah, chairman of the commissioners of Chatham county; J. F. Lewis and C. Lochridge, of the Atlanta *Constitution*. The first car to reach Atlanta was the pilot at 4.30 o'clock, with twenty-five others following closely behind. The route then was out to the speedway and the clubhouse.

The following twenty-six cars out of the thirty starters finished the run: Stevens-Duryea, F. C. Battey; Stevens-Duryea, Harvey Granger; Packard, George W. Tiedeman; Chalmers-Detroit, T. A. Bryson; Packard, N. G. Browne; Stevens-Duryea, C. Barrow; White Steamer, F. F. Stacy; Stevens-Duryea, A. W. Solomon; White Steamer, L. H. Hilton; Buick, J. F. Toole; White Steamer, O. B. Martin; Crawford, W. C. Mahoney; Chalmers-Detroit, G. I. Taggart; Maxwell, W. H. Towles; Maxwell, R. Brockett; Cadillac, W. G. Austin; Cadillac, W. T. DeBorde; Buick, Frank Hahne; Ford, M. Ed. Wilson; Schacht, B. B. Tippins; Buick, T. E. Youmans; Buick, D. P. Everett; E-M-F, Charles Graham; Buick, A. Weill; Maxwell, E. G. Gager.

The technical committee soon set to work examining the cars, but discovered that it was impossible to get through that night, so gave up the work until the following day. It was found that two or three cars in each class had made perfect scores, or very

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Capturing the Juicy 'Possum in Sunny Georgia

nearly perfect, and to decide the winners it would take almost a week. The winners will be announced by the middle of next week. Those that have a look-in at first prizes in each class are:

CLASS A

Car	H.P.	Owner	Driver	Observer
Stevens-Duryea	24	C. Barrow	C. Barrow	J. Jones
Buick	40	R. V. Connerat	J. S. Toole	H. F. Kuck
Packard	30	N. G. Browne	N. G. Browne	C. Osborne

CLASS B

Maxwell	30	W. H. Towles	W. H. Towles	W. J. Robider
Maxwell	30	W. L. Hazzard	R. Brockett	G. R. Foltz
Crawford	30	Savannah Taxi Co.	W. C. Mahoney	W. T. Knight

CLASS C

Maxwell	10	Maxwell-Briscoe Co.	E. G. Gager	H. Wright
Buick	22	A. L. Weil	A. L. Weil	A. Ferst

J. L. Sibley, Jr., driving a Cadillac, started the same morning the Savannah club left, and, suffering from record-breaking fever, dropped out of the run, making the 304 miles in twelve hours.

LIMITATIONS OF STRANG'S ATLANTA RACER

ATLANTA, GA., Nov. 13—Strang's big Fiat racer, it appears, is helpless when attacked by the puncture demon. Strang had the 50-mile free-for-all at his mercy, when, on the eighteenth mile, he had a blow-out on his right rear wheel, which caused him to drop out. It is said to be impossible, for some mysterious reason connected with the construction of the big car, to make a quick tire change on it. Strang had done the first ten miles in 7:18.32, at the rate of 82.1 miles an hour.

Experts who have looked up the comparative "dope" on the Fiat and Barney Oldfield's Benz find that the Italian has much the greater cylinder capacity. Its bore is 7.48 inches and its stroke 6.29 inches, giving it a piston displacement of 1,106 cubic inches. What this means will be realized when it is remembered that the biggest stock car class is for 451 to 600 cubic inches displacement. The bore and stroke of the Benz are 6.1 and 8 inches respectively, giving it a displacement of 935.5 cubic inches.

THE STUNT OF ONE SALES MANAGER

ATLANTA, GA., Nov. 12—What is regarded as one of the most remarkable feats ever accomplished by an automobile was the run up Stone Mountain yesterday afternoon by a 12-horsepower Maxwell runabout. The trip was the result of an ambition on the part of General Sales Manager C. W. Kelsey, of the Maxwell-Briscoe Company. About a year ago some mention of the mountain was made in Mr. Kelsey's presence and he then ventured the opinion that if man could climb the steep ascent his machine could, too. He was laughed at, but quietly waited his time.

Thursday afternoon he announced himself ready to make the trial and chose E. G. Gager, of the Pittsburg office, to accompany him. Another party went in one of the larger Maxwell cars and included M. Rambo, of Birmingham; William Towers, of Rome, and Robert Davis, of Detroit. Mr. Kelsey chose the same machine that made the tour from New York to Atlanta, and which immediately on its arrival here was shipped to Savannah and made the Savannah-Atlanta *Constitution* good roads run with a perfect score.

The start from Atlanta was made about 1 o'clock and the run out to Stone Mountain accomplished in about forty minutes. The little machine was sent immediately at the beginning of the ascent and went up like a squirrel climbing a tree.

When it reached the top the party were so excited they could hardly express their admiration, and in order to confound all scoffers, Mr. Kelsey left the machine standing to remain there over night. So, if you don't believe this, go up and look at the little marvel yourself.

CHICAGO AUTO DRIVERS ORGANIZE

CHICAGO, Nov. 13—To combat the percentage of reckless chauffeurs and other automobile drivers who are bringing discredit on all, 115 owners and chauffeurs organized at a meeting yesterday evening the Auto Drivers' Protective Association. Walter W. Wilcox was elected president, and Neil Gronberg secretary. The principle of the organization is the rigid enforcement of the laws.

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The Docile Donkey and His Pickaninny Sextette

May Race in Golden Gate Park

On the Main Drive of Golden Gate Park—Dutch Windmill to Right

A Stretch on the Parkway Shows a 70-Miles-per-Hour Possibility

Sloat Boulevard, Recently Completed, Without a Bump In It

SAN FRANCISCO, Nov. 13—With the Oakland Portola road race a brilliant success, the officials of the Automobile Club of California have already begun to plan its renewal every year so that it may become as much a fixture as any of the big contests of the East. It is felt, however, that the race ought to be held in this city, as the festival with which it is connected is distinctly limited to San Francisco. When the plan was broached for holding the race here the instant objection was made that no suitable course for such a race could be found within the city limits. But one of the most enthusiastic racing men of the club had been doing some quiet investigating and it did not take him many minutes to show the committee that San Francisco has within her borders the finest race course in this country.

The course as proposed by the racing man goes through the famous Golden Gate Park, down the Great highway, over Sloat boulevard, and back into the park by the way of Nineteenth avenue. "Jack" Fleming, who drove the winning Pope-Hartford in the Portola race, declared that with one exception every turn on the course can be taken at sixty miles an hour, and the noted driver spoke with authority, for while the park police were not looking he tried out the turns with his racer.

The course starts and finishes where the main driveway joins the south drive in the park. It swings into the Great highway where the Norwegian ship *Gjoa*, the first vessel to sail through the Northwest passage, lies at rest, and from there by an easy double turn into the new Sloat boulevard, which is wide enough for ten machines to run side by side on it. The turn from the Sloat boulevard into Nineteenth avenue is sharp, but it could be banked so that racers could pass it without danger. From Nineteenth avenue the course plunges up a short incline into the park again. The total mileage of the course is slightly over 11 miles, the ideal distance for the road race.

Within the park the roadway has the finest oil surface ever constructed in this State of oiled roads. The Great highway is also oiled, and the hard sea sand forming the foundation makes it an ideal road. The Sloat boulevard, but lately constructed, is an example of what an automobile road ought to be.

Just before approaching the Ocean boulevard the Pacific can be seen in the distance, and on the right is the famous Dutch windmill recently presented to San Francisco. The photograph at the top of the column illustrates this view.

Maurice Clement, in New Bayard-Clement Auroplane, Which He Is Now Flying at Issy les Moulineaux

WHAT THE FRENCH MAKERS ARE NOW PRODUCING

PARIS, Nov. 12—Although there is no automobile salon in Paris this Winter, French constructors have not altogether neglected to produce new models or to modify their old ones. Modifications, indeed, will be much more numerous than the creation of new types. It can be taken, as a general rule, that all the old types remain with but few modifications with a view to simplicity and silence. The new creations are small cars, or rather light cars, varying from 12 to 18 horsepower, designed for town service with closed bodies, or for touring work with open bodies. This class of automobile is the only one meeting with any real success in Europe at the present time. The moderate-powered car has its limitations, but its advantages are such that it not only interests present owners, but by reason of its moderate price and economical up-keep attracts those who have not hitherto been interested in automobiling.

What Darracq Has Produced

Darracq has produced a car of this type, which is really a simplification and development of the previous models, the features being a design of such a nature as to reduce the cost of labor and thus make possible a very cheap production. The frame is original, being pressed in its entirety from one piece of steel and having its side arms and undershield all in one piece. The side members are of inverted U-section, and the lips on which the engine and gear-box are mounted prevent distortion, and absolute rigidity is secured by a cross-member at the front of the pan and two other members behind it, one being at the bend of the frame and the other at the extreme rear. All riveting is economized with the exception of the three cross-members mentioned and the dumb irons.

Maurice Clement at Wheel of Bayard-Clement Biplane

This type of frame is the outcome of a long series of experiments, one of which was the production of a complete frame and a two-seated body in two steel stampings. The new Darracq engine is a four-cylinder monobloc of 85 to 100 millimeters bore and stroke, rated at 14-16 horsepower. Only slight changes have been made in the design of the engine, one of them being the fitting of an oil float, the spindle of which projects through the crankcase breather and indicates the amount of lubricant in the base of the crank chamber. The gearbox, bolted to the inswept portion of the frame, is of very short over-all length, and provides three speeds forward and reverse. Shaft drive is employed with a universal at each end. There is no torsion rod, the three-quarter elliptic springs acting as distance pieces and resisting the reaction of the driving effort. Engine control is by accelerator pedal; the dashboard is perfectly free, not even carrying a sight feed, while the gear change is of the selective type, the levers being steel stampings.

Renault Has Four-Cylinder in One Casting

Renault has in hand a four-cylinder model in one casting, this being the first time that cylinders have been produced at this establishment in other than twin castings. Details of the motor have not yet been decided upon, but it is doubtful if any very important changes will be made other than in the method of casting. A new six-cylinder model of only 18 horsepower is being produced, and attention has been paid to the American market by the creation of a 20-horsepower Colonial model, with enough clearance for any American road, and all parts strengthened for high-speed work over rough surfaces.

Panhard Joins the Monobloc Division

Panhard, after being an advocate for years of separate casting, has brought forth a monobloc engine of 12-14 horsepower. The four cylinders have each a bore and stroke of 3 1-10 by 4 7-10 inches, valves on one side, a crankshaft carried on three bearings, thermo-syphon circulation and high-tension magneto. Piping has been reduced to a minimum by casting the intake and the exhaust manifolds with the cylinders, thus giving the ex-

haust the advantage of the cooling water and warming up the intake. The high-tension magneto, with fixed sparking point, is alone on the valve side; the leads are very short, for the sparking plugs are carried in the cylinder head immediately over the intake ports.

The carbureter, a modified Krebs, is alone on the opposite side of the engine, the only intake piping being a single length passing into the manifold cast with the cylinders within the water jacket. Thermo-syphon cooling, also an innovation for Panhard, is through a special type of gilled tube radiator, with a water tank assuring a head of water and very wide area of straight pipes. Lubrication is a combination of drip and forced feed, the flow being to the engine bearings and to the gearbox. The power is transmitted through a cone cutch, a three-speed gearbox and propeller shaft to a rear live axle. An armored-wood torsion rod on the girder principle is used, though the forward halves of the three-quarter elliptic springs are used as radius rods. This is the only "armoring" about the car, the frame being of the usual pressed-steel type.

Clement Copies Renault Radiator

Bayard-Clément is another large firm having copied the Renault design of a radiator on the dashboard with thermo-syphon water circulation. The models on which this has been produced are two and four-cylinders identical with the exception of the number of cylinders. In each case dimensions are 31-10 by 37-10 inches bore and stroke, the fours as well as the twos being a single casting. Every effort has been made to produce a simple, clean-cut engine. The intake manifold is cast with the cylinders; the water piping and exhaust manifold are separate, but each one is held by a couple of bolts only. Valves are on one side, and magneto in front, in the most accessible position when the radiator is at the back.

The carbureter is a model of simplicity, consisting of a float chamber having its top held on by a spring finger, and a vertical nozzle, around which is a straight tube with a bell bottom, the upper end of which screws into the intake manifold. There are no oil pipes on the engine whatever. The lower portion of the crankcase forms an oil tank, from which the lubricant is pumped into a series of troughs for each connecting rod to dip into; the overflow finds its way back to the base of the chamber. On the right-hand side of the engine is a combined oil filler and crankcase breather, through the cap of which projects the

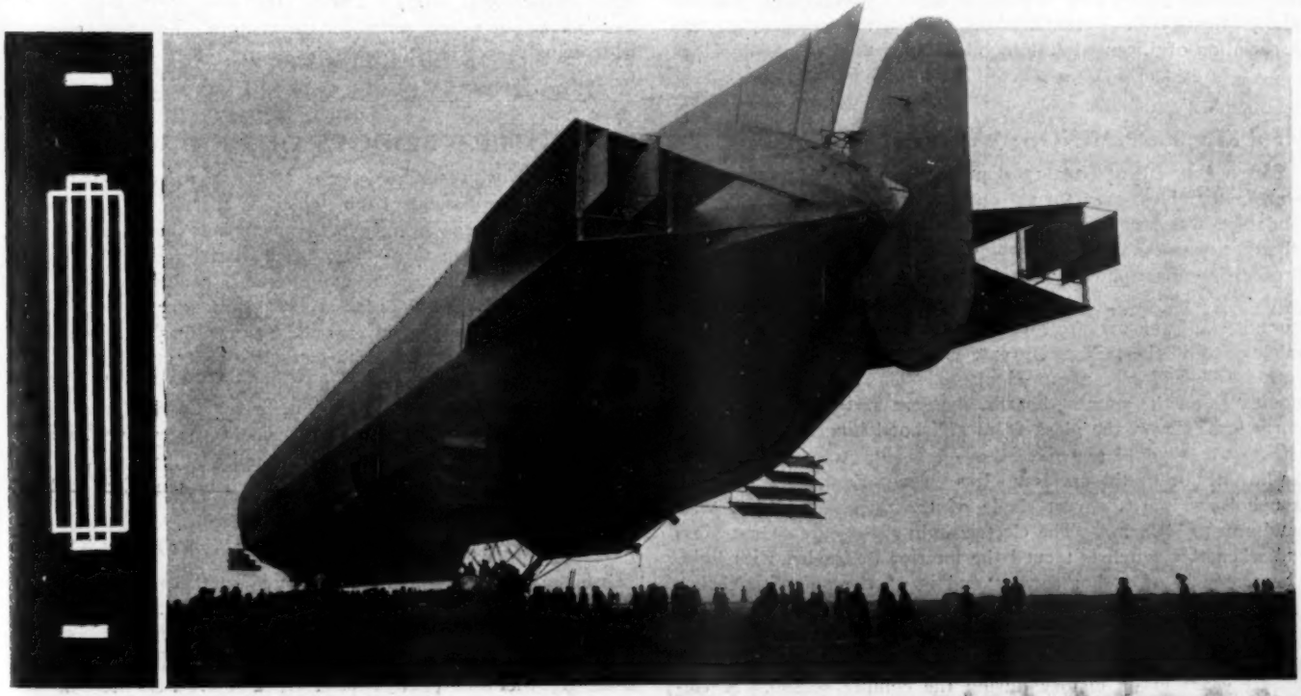
Henry Fournier Now Operating Voisin Biplane

spindle of a float in the oil chamber, this indicating the amount of oil in the base. There is a three-way cock by the side of the filler, which allows more oil to be run into the case or excess drawn off as desired. Paris regulations against smoky exhausts are doubtless responsible for these details.

A three-speed progressive type of gearbox is employed, one of the features of which is a lever passing directly onto the gear-shifting mechanism without the use of any intermediary. This is rendered possible by having the driver's seat on the left instead of the right-hand side. Final drive is by propeller shaft carrying a single universal joint.

New Type of Concentric Valve

In connection with a four-cylinder aeronautical motor, Panhard has produced an interesting type of concentric valve. The motor has four separate steel cylinders with copper jackets having a bore and stroke of 43-10 inches by 51-2 inches. The cylinders are set so close together that the circulating water ports touch and are made watertight merely by a steel collar lined with rubber. The valve seating is screwed into the cylinder head. It comprises a guide for the concentric valve, the intake port, and two arms to receive the rocker-arm bearing. The stem of the exhaust valve is a hollow steel cylinder with the walls cut away to allow admission into the tube. Within the



This Excellent Photograph of the Zeppelin Airship Gives a Comprehensive Idea of Its Hugeness

exhaust valve is the intake valve, the seating of which is on the head of the exhaust. Although the concentric valve is not new, being adopted by several French makers of aero engines, most of them make their intake automatic.

On the Panhard the intake, like the exhaust, is mechanically operated. By means of the vertical push rod and the overhead rocker arm, the exhaust is operated in the usual way, and although the intake is carried down at the same time, it remains seated on the head of the exhaust. When the inner end of the rocker arm is raised, causing the exhaust valve to be brought back to its seat, it has in turn to depress the intake. The end of the rocker arm is forked, and as it rises this end lifts up a second and shorter rocker arm, pivoted on the disc-shaped end of the exhaust and at right angles to the main rocker. A suitable spring causes the roller at the end of the push rod to follow the depression on the face of the cam, without which the rocker arm would not rise sufficiently to allow the forked end to fully operate on the intake valve rocker.

The intake manifold runs down the head of the engine, the mixing chamber, with air inlet, being in its center and the carbureter by its side. The combustion chamber is hemispheric, with sparking plugs inserted just below the concentric valves. As the fresh cool gases pass within the cylindrical exhaust valve stem, this latter is always maintained at a reasonable temperature. The motor is rated at 35-45 horsepower. Fully equipped, but without cooling water, its weight is 200 pounds.

TENTH GARDEN SHOW WILL BE ELABORATELY DECORATED

SOME interesting light on the methods of decorating Madison Square Garden for the Tenth National Automobile show, which will be held there during the week of January 8 to 15, has been given by W. W. Knowles, the decorator, and the committee in charge of the show, consisting of Col. George Pope, chairman, Charles Clifton, E. P. Chalfant and Secretary Merle L. Downs. The discussion turned upon the details of the preparatory work which is now in progress. From the way the various items were dealt with it seemed almost as if the committee were planning to create a permanent hall of art instead of a seven-day affair in an exhibition building. It is almost unbelievable that so much elaboration ever would be entered upon for a single exhibition. Already carpenters, sign-makers, wood-workers and painters are working zealously on the skeleton for the decorative creations.

In seeking to produce a proper setting for the automobiles, motorcycles and accessories, the show managers will not spare expense; this is made very clear by the fact that more than $30,000 is to be expended for the decorations. The annual automobile show in the Garden is becoming every year more important as a social event, at which the latest fashions in both cars and costumes are displayed, and for several years now it has been the yearly affair for which the Garden is most handsomely decorated. White and gold are the colors that have been selected to predominate in the decorative scheme next January, although crimson and green also will be strongly in evidence. On the whole, the Tenth National show, under the auspices of the Association of Licensed Automobile Manufacturers, at which are shown only American cars, the output of representative makers will be brighter in its general tone than any of its predecessors, which is saying a good deal, past exhibitions considered.

At the show of last January the employment of plaster statues and other staff work was done away with to a great extent. The forthcoming show will be practically free from this rather tawdry class of ornamentation and an effect of solidity and massiveness will be produced, together with an impression of distance, breadth, and general roominess. At some former shows the visitor entering the Garden was confronted by a mammoth piece of statuary which interrupted the view of the *ensemble* on the floor beyond. This time a Roman seat, or fountain, which is not of a height to assert itself offensively, and permits a comprehensive view of the Garden, will be constructed opposite the entranceway to aid in the plan of "opening up" the interior.

The fountain will be in the form of a low abutment of gray stone, curving gracefully about the spaces of those exhibitors that face the entrance on the Madison avenue side. It will have a trough-like basin, and at each end and in the center water will spray from the mouths of griffins and gargoyles upon the pool beneath, made iridescent by cunningly hidden lights. The falling water also will be electrically radiant. There will be goldfish and natural pond-lilies in the pool and mingling with the natural lilies will be artificial water plants from which will radiate other vari-colored lights. Carved into the front wall of the fountain will be a long settee for the visitors. Two bay trees will be seemingly growing through this seat.

ITS TRIMMINGS ARE GOLD PLATED

SOUTH BEND, IND., Nov. 15—One of the most elegant and elaborate automobiles ever turned out of the factory, a Studebaker landaulet, was recently shipped from this city to San Francisco, where it was on display in the salesrooms of the Studebaker Brothers company during Portola week. An idea of the elegance of the machine may be gained when it is stated that all the metal trimmings of the car are gold plated. The two headlights, the sidelamps and the taillamp, grease cups, hub caps, body handles, both inside and out, are gold plated. The horn and tube, the mouldings on the running boards, the gear shift lever, the emergency brake lever, the glass front and hood hinges, handles and catches are all gold plated.

The interior of the car is no less elegant than the outside; it is upholstered in a covert shade of the finest broadcloth with handsome gold lacing. The electric light globes are of cut glass and when the switch is turned the interior is flooded with light. The motor is of 40-horsepower and is of the new Studebaker type, the "G-7." All the new features of this model are embodied in this car, which is painted blue with a fine white stripe.

The immense Studebaker plant promises to enjoy one of the busiest years in its history during the coming season. A volume of orders is awaiting shipment, with more coming in daily.

TO PROTECT BRIDGES OF CHICAGO RIVER

CHICAGO, Nov. 15—A suggestion to the board of managers of the Chicago Automobile Club, which is to take up the matter of safeguarding the bridges at a meeting to be held today, is made in a letter sent to that organization by the Walden W. Shaw Taxicab Company, which offers to contribute $100 to a fund to be used for the erection and maintenance of permanent iron gates at the bridges in case the city declines to do so. The Shaw Company feels that such gates are necessary for the protection of the traveling public, and believes they should be placed 40 or 50 feet from the brink of the river. Mr. Hertz, of the taxicab company, points out that accidents occur even when a car is keeping well inside the speed limits, it being possible to skid on a wet pavement even with a speed of ten miles an hour.

AUTO TRADE INCREASES CHICAGO VALUES

CHICAGO, Nov. 15—Michigan avenue frontages in the vicinity of automobile row are rapidly advancing in value. Leon Mandel, of Mandel Brothers, of department store fame, has just purchased 150-foot frontage in the block south of Twenty-eighth street, for which he paid $250 per front foot. It is the only plot available in that section, and several auto concerns are after it.

Should Gears Progress Geometrically or Arithmetically?*

By Louis Lacoin

AN explanation can hardly be clear unless every one of the words used in it is clearly defined—unless its entire signification is made plain. It is necessary for the benefit of the non-technical reader, not to go beyond the usual terms. Unfortunately, however, that is not always possible. How, for example, can the difference which exists between the two series of speed changes of an automobile be explained, when they are merely expressed by the following numbers: 12-21.5-31-40.5, or 12-18-27-40.5? In the first case, the steps are regularly spaced; in the second, each is 1.5 times that of its predecessor.

Certain builders prefer the first series. Others have a leaning toward the second; they find that the motor "picks up" better, when there is a constant relation between the different steps in the speed. To be precise, they say that the series of speeds of an automobile should be in *geometric progression*, rather than arithmetical progression. These expressions can convey no very definite meaning unless just what these progressions are is known, and just what constitutes the difference between a geometrical and an arithmetical progression. For the benefit of those readers who are not familiar with the terms, they are explained here, in addition to which the manner in which they came to receive their names is also appended.

In mathematics, there is an infinity of progressions; they comprise all those series of numbers which follow a determined law. Each number, or *term* of the progression, is deduced from its predecessor by means of a calculation which is always the same. The most simple calculations being the four operations of arithmetic, the most simple progressions, as well as the most common, are those which are formed by successive additions of the same number, or by substraction, multiplication, or division. Progressions formed in this manner have received the designation of arithmetic, ascending or descending, and of geometrical progressions, increasing or decreasing. The geometrical progressions may be formed, just as in the case of the others, by purely arithmetical operations, but they may also be formed geometrically, as will be shown presently. From the latter comes their name, and it is well to distinguish the two by different appellations, as their properties are different.

Arithmetical Progression—The law governing the formation of the arithmetical progression is very easily comprehended. Each term is deduced from its predecessor by the addition, or subtraction, as the case may be, of a quantity that is always invariable. For instance:

2-4-6-8-10-12

or 1-3-5-7-9-11-13-15

are two series of numbers in arithmetical progression. Both are termed ascending progressions, because each succeeding term is greater than its intermediate predecessor. In both cases their formation consists of the simple addition of the same number, *i.e.*, 2. This constant is termed the ratio of the progression. Descending arithmetical progressions are formed by the subtraction of a constant, as for instance:

10-9-8-7-6-5-4-3-2-

a descending arithmetical progression, of which the ratio is 1.

To distinguish them further, the first two would be designated as arithmetical progressions, of which the ratio is plus 2, and the third, as minus 1, making it unnecessary to state whether an arithmetic progression is ascending or descending, as the signs plus or minus indicate this. When they are omitted, it is assumed that the progression is ascending. In this manner, the speeds of an automobile are represented, in kilometres per hour, by the following: 12-21.5-31-40.5, this being an arithmetical progression of the ratio of 9.5.

Geometrical Progression—Multiplication and division are the operations involved in the formation of the geometrical progression. To produce each succeeding term, its predecessor is either multiplied or divided by a fixed quantity. This constant, as in the case of the arithmetical progression, is also called its ratio. The series of numbers:

1-2-4-8-16-32-64

is a geometrical progression of which the ratio is 2, while

18-8-4-2

is another of the descending order, but having the same ratio.

It will be observed that the law of the formation of the last progression may be expressed in two ways. It may either be said that each is equal to its predecessor divided by 2, or, what amounts to the same thing, that it is equal to its predecessor, multiplied by 0.5. In order to avoid confusion, the latter operation is always indicated, and 0.5 is known as the ratio of the progression. A geometric progression is increasing when its ratio is greater than 1, and decreasing when less than unity. We have already had an example of two arithmetical progressions that were totally different, yet each had the same ratio. This is equally the case with the geometrical progression. Here are three having 2 as ratio:

3-6-12-24-48-96-192
5.5-11-22-44-88
1.1-2.2-4.4-8.8-17.6

Their Application to the Auto—Let us see how the geometrical progression may be applied to the change speed gears of an automobile. Assume, in order to have terms of comparison, that the extremes of the speed are 12 and 40.5—the figures we have already employed. It is always possible to find a ratio which will make the problem possible. Here this ratio is the quantity 1.5. The result of three successive multiplications by 1.5 gives the following series of speeds:

12-18-27-40.5

while the arithmetical progression would be:

12-21.5-31-40.5

The difference in the formation of these two progressions will be clear at a glance. In one, there is an equal distance between speeds, *i.e.*, 9.5, while in the other, there is an equal relation between the speeds as $\frac{18}{12} = \frac{27}{18} = \frac{40.5}{27} = 1.5$, the relation each term bears to its predecessor.

Even though the arithmetical progression appears to space the speeds better, the motor accommodates itself infinitely better to the geometric progression, for the following reasons:

Let us take a motor the most favorable speed of which lies between 1,000 and 1,500 r.p.m. If the speed may be maintained within these limits it will be working under the best possible conditions. But with each change of speed, the number of turns of the motor vary in inverse proportion, and if two of the speeds, the first and second, for example, bear the relation of 1.5 to each other, the motor running accelerated on the first speed will be

* Translation from "Omnia" by C. B. Hayward.

turning over at 1,500 r.p.m. Passing to second, which means dividing 1,500 by 1.5, its new speed will be 1,000 r.p.m., which means that it will still be within the limits of its most favorable operating conditions, upon reengaging the clutch for second speed. If the successive speeds be all in the same relation, the motor, except on the first slow speed, or the fourth accelerated speed, will not have to make a number of turns less than 1,000 r.p.m. or greater than 1,500 r.p.m. Should it race or slow down overmuch, a change of speed will bring it back within the desired limits.

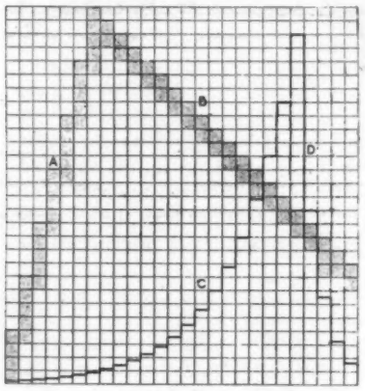


Fig. 1—Showing different progressions

Under such conditions the motor will always produce its maximum effort, and to achieve this the geometric progression is certainly ideal.

Arithmetic Progressions Compared — To show how true the foregoing is, a contrast may be drawn between it and the variations of running condition brought about by the use of an arithmetical progression between the same limits, as:

12-21.5-31-40.5

The two first speeds give as their relation 1.79, and at the moment of passing from first to second, it will either be necessary to race the motor until its speed reaches 1,790 r.p.m., to redescend to 1,000, or, in case the motor has not reached higher than 1,500, its speed will fall to 837 r.p.m. In both cases, it will be outside of the limits of its most favorable operating conditions.

On the contrary, in the two following changes $\frac{31}{21.5} = 144$, and $\frac{40.5}{31} = 1.305$, the variations in the r.p.m. rate are very small. Why not profit to the full extent of the flexibility of the motor at these two higher speeds, when at the lower two it is so abused. This involves an anomaly that is excusable to but a certain degree.

Instead of dwelling on the point, let us explain the difference in another way by referring to the first illustration, showing the arithmetical progressions A and B, and the geometric progressions, C and D. It will be seen that in the aritmetical progressions the steps fall either above or below one or the other of the equal quantities. In A, for example, each number is raised four units more than its predecessor; in B, it is one unit less, but the ascent and descent are always regular.

In the geometric progression, on the other hand, the increase takes place in proportion to the increase in the number. Each number of the series C is greater than its predecessor by a quantity equal to one-fourth of the number. Finally, in D, which is a decreasing geometrical progression, each number is half of the preceding one. Mathematicians base numerous calculations on these progressions, but they are without immediate interest in the present case. Ability to distinguish between the two is the important thing, and this is not difficult, as will be seen.

Fig. 1 has served to show in a striking manner the difference between the two progressoins, and it has the further advantage of showing the *raison d'etre* of their appellations. Mention has already been made of the fact that in the arithmetical progressions shown on the diagram in question, the steps rise one above the other by equal quantities. But it must be added that the extent of the quantity is not known except by that characteristic. Without having the step of the diagram, neither the numbers which form the different terms of the progression, nor the ratio of the progression would be known. The curve A might represent quite as well an arithmetic progression of the ratio 1, if we take as unity the measure of the height of the steps, that is the vertical distance separating two consecutive steps, as of the ratios of 2, 3, or 4, or we might take for unity, one-half, one-third, or one-quarter. It is well known that in certain diagrams the measure of the length of the step may exceed that of its height, and in consequence, the length of the steps gives no indication of the exact value of their height, expressed in figures. As a result, diagrams, or to put it in another way, geometry, is of no assistance in the arithmetical progression. All arithmetical progression may be represented geometrically in the same manner, simply going up the given distance each step.

Taking up the geometrical progressions, C and D, it will be seen that by simply comparing the heights of the two series of steps, the fact that the first of these two progressions has a ratio of 1.25 and the second a ratio of 0.5 will be known. This geometric characteristic distinguishes this type of progression from the other, but does not suffice to justify its name. The true origin of the latter is to be found in a method of formation which is peculiar to the geometrical progression. In fact, with the aid of geometrical constructions, it is possible to form the different terms of such a progression. There are quite a number of such constructions, but it will be sufficient to describe one of them.

Let OA be the first term of the progression, and OB the second, AO and OB being distances measured on the same line OX. Trace another line OY, also having as its starting point O and mark on it the arbitrary point C. Join CA and CB. If now a line from B be drawn to D, parallel with AC, and a second one from D, parallel with CB, it is easy to see that $\frac{OE}{OB} = \frac{OB}{OA}$. OE is, accordingly, the third term of the progression, of which OA and OB are the first two. Continuing in the same manner, the following terms, OG, OK, OM are found, from which it will be plain that the term geometric is well applied to a progression which may thus be constructed geometrically. The same figure provides a whole series of geometrical progressions, first, the one already pointed out, viz., OA-OB-OE-OG-OK-OM, and then on the line OY, the progression OA-OD-OF-OH-OL of exactly the same ratio as the preceding, but with different terms. In the same manner, AC-BD-EF-GH-KL and CB-DE-FG-HK-LM are two further progressions having the same ratio.

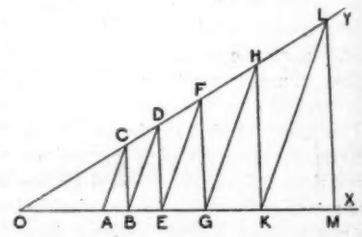


Fig. 2—Form of geometric progression

ENGLISH FORM OF PNEUMATIC SUSPENSION

The current issue of the *Automotor Journal* contains a description of an English invention designed to form a pneumatic support for the chassis of a car, entirely replacing steel springs. The apparatus, known as the Cowey pneumatic suspension, consists of four cylinders, attached to the frame, and corresponding pistons, connected to the axles by ball-jointed links. Air pressure is maintained by a motor-driven pump, with a reservoir, supplying all four cylinders. The air inlet valve to each cylinder is controlled by the piston, through a coil spring and oil-filled dashpot. The ordinary shocks of the road do not affect the valve, but a steady load, such as that of an extra passenger in the tonneau, will open the valve and let in more air, raising the frame to normal position. The pistons are lubricated and sealed by a layer of oil on their heads, maintained by oil carried by the incoming air. The suspension has proved very easy-riding. Its relative increment of stiffness caused by a given travel of the axle toward the body is very much less than that of a steel spring. At the same time it automatically acts as a shock absorber, checking the recoil of its own motion.

ADVANTAGES OF MULTIPLE IGNITION BATTERIES

By A. L. Haskell

ONE of the main objects of the manufacturers of gasoline engines of all kinds at the present time is to furnish to the user an outfit that is practically "fool proof" and free from trouble. It is the purpose of this paper to show what dry-battery manufacturers have been doing to help attain this object.

No part of the equipment of a gasoline engine is so subject to the control of the operator as the ignition devices, and since the operator is more often a mechanic than an electrical man, it

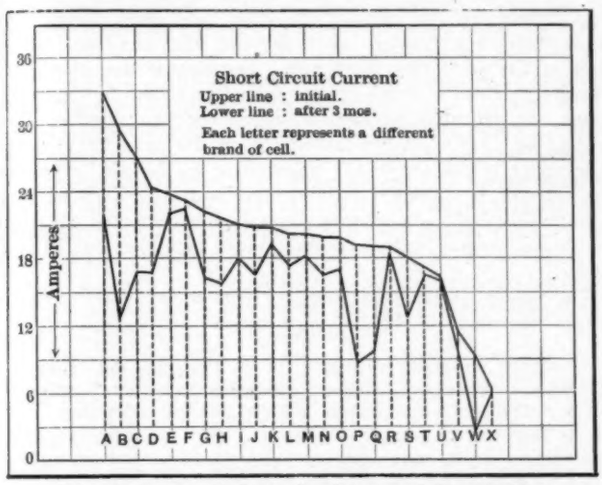


Fig. 1—Curve of short-circuit current in amperes

is very desirable to have the whole ignition outfit in such shape that his adjustments will not do an appreciable amount of damage. On account of its simplicity, efficiency, accessibility and low cost, the dry battery is particularly valuable in this connection. The other desirable quality is reliability, and it is to insure this point that the dry-cell manufacturers have devoted much time, labor and money in research work.

How the Perfect Battery Is Evolved—The batteries are tested a number of times in the course of manufacture; are then seasoned for a sufficient length of time to allow any internal defect to show itself; then subjected to a final inspection and test before shipment. This factory inspection is very necessary to insure the customers getting a uniform and satisfactory product, for, as we will now show, it is practically impossible for the user to determine beforehand whether the battery he is buying is a good one or a poor one.

The method quite often followed is to test out batteries with an ammeter and go on the assumption that a battery that registers a high current is a good one, and one registering lower in amperage is not so good. Unfortunately, this method is practically valueless, as will be shown by the illustrations.

On the drawing Fig. 1, showing the short-circuit current of a number of batteries of different makes, the letters A, B, C, D, etc., each represent a particular brand of battery, and the upper line shows the corresponding initial amperage of each battery. For instance, battery A has an initial amperage of 33; B runs 29; K runs 21, and X runs only about 6 amperes. The lower irregular line indicates the amperage of each cell at the end of three months standing idle on a shelf. It will be seen that battery A dropped from 33 to 20; battery B has dropped from 29 amperes to 13; battery F has dropped from 23 to 22 1-2 only, and so on. Since it is not always possible to put dry cells into service immediately after manufacture, and they are sometimes kept on the shelves for several months before reaching the user, it is evident that the amperage reading alone is of very little value unless the characteristic initial current and the age of the battery are known.

No Real Relation Between Initial Amperage and Service Capacity—In Fig. 2 the letters represent the same batteries batteries, the solid black line represents the initial current of each, and the irregular dotted lines represents the service in ampere hours given by these batteries under accurate testing conditions. The ampere-hour figures are given on the right-hand side and the initial current figures are given on the left-hand side. Battery B, which registered 30 amperes to start with, gives 25 ampere hours; battery L, which registered 20 amperes to start with, gives 36 ampere hours, and battery T, which registered 17 amperes to start with, gives 43 ampere hours. The diagram shows very clearly the lack of any real relation between the initial amperage and the service capacity.

This amperage test does have some value, however, in the fact that if it is known how high a certain battery generally tests when new, the current reading will show whether the battery is very old or has been used to any considerable extent. If a dry cell is supposed to register 20 amperes normally, and is found when tested to show from 18 to 22 amperes, it is a good sign that the cell is in good condition. If, however, a battery normally shows 30 amperes or higher, as some of them go, and is found testing 18 to 20 amperes, it either means that the battery is deteriorating very rapidly or is quite old.

It is easy to explain why a high amperage does not necessarily mean a good battery, as this amperage is only an indication of the internal resistance of the battery, and has nothing to do with the service life of same. If a cell were made up with the mix composed entirely of active chemicals with a high resistance, the internal resistance of the whole battery would be high and the resulting initial amperage would be very low, although the service life obtained might be good. If, on the other hand, there were very little of this high resistance active chemical in the mix, and some substances with a low electrical resistance, but which had no beneficial action in the battery, were introduced, the current would be very high and the service life proportionately short. The only advantage of such a cell would be that it would sell easier to a novice than one registering a lower amperage. The best practicable method, of course, for

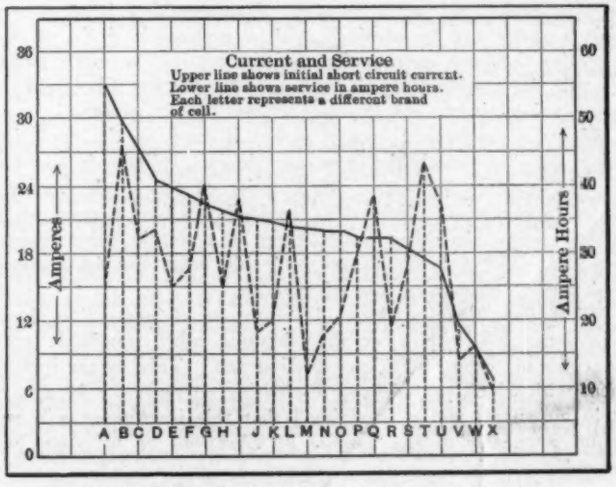


Fig. 2—Short-circuit current and service in hours

* Paper read before National Gas and Gasoline Engine Trades Association annual meeting at South Bend, Ind., summer of 1909.

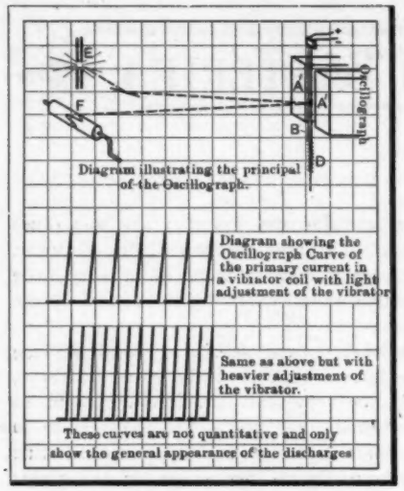


Fig. 3—Construction of the oscillograph and several typical curves made by it

a manufacturer to follow in the long run is to make up a battery to give the maximum amount of service under the conditions in which the battery is intended to be used, and let the resulting amperage be what it may.

Some Coils Draw More Current Than Others—There are certain ignition devices on the market at the present time that give most satisfactory results in operation on a very small amount of current; some of them, using a mechanical make-and-break with a non-vibrating coil, will operate a four-cylinder engine on an average current consumption of from .1 to .2 of an ampere and develop the maximum amount of power from the engine. There are coils of the vibrator type that will do the same thing on an average drain of .2 to .3 of an ampere. With a coil of either of these types the user is practically assured of getting perfect service from dry cells.

Unfortunately there are a number of other coils that require an excessive amount of current to operate satisfactorily, and it is usually the case also that these coils require frequent adjustment, as a consequence of which they are drawing much more current than they need by the time the adjustment has been changed a few times. In the first place, the coils are poorly designed, the vibrator is not made of the best material, the contact points are not made of material that will stand the pitting due to the heavy current, and the operation in general is apt to be unsatisfactory. There has been a marked improvement along this line, however, in the last year, and excellent oils can be obtained at a very reasonable price.

No. of Cells	Impulse Voltage	Impulse Current
6	4.55	9.5
6	4.55	9.5
6	4.55	9.5
6	4.55	9.5
5	4.0	8.15
5	4.0	8.15
5	4.0	8.15
4	3.3	6.9
4	3.3	6.9
4	3.3	6.9

1 Cells in Series	3 Impulse Current
6	10.5
5	9.0
4	7.6

A number of manufacturers have made the claim that a high current consumption with a coil is necessary to give a fat, hot spark that will develop the maximum amount of power from an engine. The importance of the big spark has unquestionably been overrated, as tests that we have made on engines equipped with a brake and on a number of automobiles have proved that a spark can be obtained with a reasonable drain on the batteries that will operate the engine with just as much power as will the excessive spark, and has the further advantage of not causing pitting and burning of the contact points.

Where a mechanical contact maker is used, so the explosion takes places at exactly the same point in each cylinder in a multi-cylinder engine, the degree of intensity of the spark does not make an appreciable difference, provided you have a good spark to start with. In other words, there is a certain point beyond which it does not pay to go, and this point can be reached with a very economical use of current.

What Test Results Show—It might be of interest to show here some preliminary results obtained with standard types of coils in testing with an oscillograph. This is an instrument with which very delicate oscillating currents can be accurately measured, and it is claimed that this instrument will respond accurately to any number of vibrations up to 10,000 per second.

The principle of the oscillograph is illustrated in the sketch Fig. 3. A and A¹ are the poles of a powerful electro-magnet, between which is suspended a fine U-shaped wire of silver, B. This wire is held under tension by the spring D, and the very small mirror C is attached to both legs of the U at its middle point. The legs of the U are only .4 of a millimeter apart, and the diameter of the mirror C is the same. If a current flows through the silver U it will be slightly turned because of its being in the magnetic field AA¹ and its motion will be indicated by a beam of light shown as a dotted line coming from the arc E. This motion can be registered on a drum at F or can be thrown directly on a screen and observed by the eye.

The first tests made were on one unit of a coil vibrating continually. The oscillograph was connected in the primary circuit of the coil and it was allowed to vibrate with a ¼-inch spark gap in the secondary. The measurement of the maximum rise in impulse with 6, 5 and 4 cells in series, and a number of adjustments of the vibrator in each case were taken. The measurements were also taken showing the maximum of current in the secondary discharge. The appearance of the discharges obtained through the spark coil as shown by the oscillograph are indicated diagramatically on the two sketches shown below the sketch of the apparatus in the attached drawing. The upper sketch shows the appearance of the discharge when the vibrator is making a light contact and the coil is operating economically. As the vibrator is gradually tightened the record on the oscillograph glass becomes more nearly as in the lower figure.

The values of the maximum currents under various circumstances are given in the following tables:

	Primary Circuit		Oscillograph	Record
Vibrator	Voltage	Current	Primary	Ratio	Secondary
1	8.55	.70	3.36	35.4	.030
2	8.55	.72	3.10	32.6	.023
3	8.20	1.22	4.10	43.2	.034
4	7.95	1.70	4.04	42.6	...
1	7.10	.32	2.68	32.9	.015
2	6.90	.72	2.99	36.7	.021
3	6.60	1.27	2.99	36.7	.026
1	5.75	.21	1.94	28.1	.008
2	5.75	.31	2.07	30.0	.015
3	5.35	1.15	2.57	37.2	.021

6 Primary Current	7 Primary	8 Oscillograph Readings Ratio	9 Secondary
.22	2.10	20.0	.025
.18	1.84	20.5	...
.12	1.52	20.0	...

The following points may be noted from an examination of this table.

1. The actual current impulse in the primary coil (column 7) is only about one-third of the impulse measured by short-circuiting the batteries through the primary of the coil (column 3).

2. As the vibrator was tightened the average current consump-

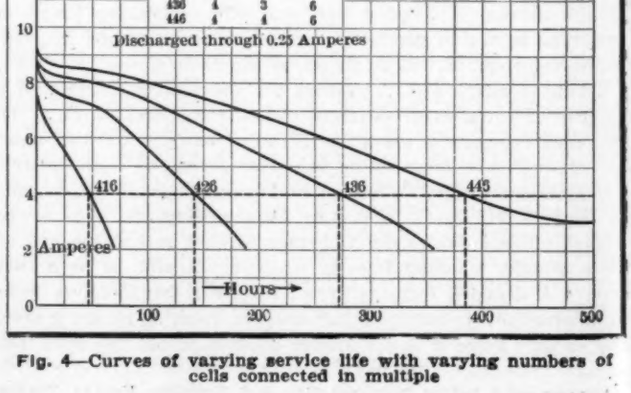


Fig. 4—Curves of varying service life with varying numbers of cells connected in multiple

tion (column 5) increased from 150% to 550%, according to the number of cells in series, while the actual impulse measured by the oscillograph increased only from 10% to 25%. This indicates that there is very little advantage to be gained by tightening the vibrator on a coil beyond a point where the current first becomes steady and even, except for the theoretical advantage that the sparks come closer together in the cylinder.

Non-Vibrating Coils Tested, as Well as Vibrating—After completing the above measurement on a vibrator a similar series was run, using the non-vibrating coil with a mechanical contact maker. The results obtained are shown in the following table, similar columns being marked in the same manner as in the previous table. Timer was revolving at about 500 revolutions when the reading was taken.

The results with this timer and coil show the following points:

1. Although the short circuit impulses (column 3) are higher than with the vibrating coil, the ratio between these impulses and the actual impulse as shown by the oscillograph (column 7) is less. This is an indication that each contact is of shorter duration than in the case of the vibrator coil.

2. The current impulse in the secondary coil is nearly as high as in the case of the vibrator coil, although the average current is very much less. This is in line with our gas engine results, which indicate that if there is current enough to ignite the mixture any excess is unnecessary, and also adds nothing to the force of the explosion.

This new field of investigation promises to give valuable results when more fully developed, but the above outline is the result of a preliminary investigation only.

By referring to Fig. 4, curves are shown indicating the discharge of batteries on ignition service when the average current with the engine running is .25 of an ampere. The vertical figures 2, 4, 6, etc., show the impulse in amperes when the batteries are short-circuited through the primary coil, and the horizontal figures marked "hours" shows the length of time they have been running when these readings were taken. The dotted line starting at 4 and running across the page indicates what is considered as the dead point of the batteries—namely, when they are no longer capable of delivering an impulse of more than 4 amperes through the coil.

The first curve shows the discharge from a single set of cells which reached the dead point at the end of 48 hours. The second curve shows the discharge of a battery composed of two sets in multiple, and these reached the dead point at the end of 140 hours. The third curve is for three sets in multiple which reached the dead point at the end of 270 hours. The fourth curve, showing four sets of cells in multiple, reached the dead point at the end of 383 hours.

Curves for Continuous Discharge—The next drawing, Fig. 5, shows a similar set of curves when the average discharge is one-half ampere continuously. Here the single set of cells runs for 20 hours; two sets in multiple for 70 hours; three sets in multiple for 114 hours, and four sets in multiple for 170 hours. The first curve represents the conditions actually obtained with an efficient ignition apparatus properly adjusted and is being duplicated every day in practice on automobile service. The second curve represents conditions met with in every-day practice when an average type of ignition apparatus with average adjustment is being used.

Another obvious advantage of the multiple connection is that batteries can be used to a much lower point when connected in multiple than when used in single series. As shown above, it is necessary for a battery to deliver an impulse of four amperes through a coil to give satisfactory service. If four sets are connected in multiple it will be necessary for each set of cells to deliver only one ampere impulse through the cell, and the battery can, therefore, be used much nearer to the point of complete exhaustion.

An interesting experiment illustrates this clearly. Forty No. 6 batteries were used in separate sets of five each until they were

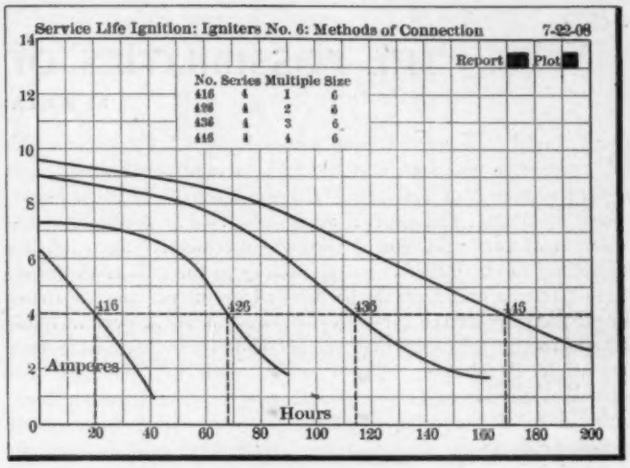


Fig. 5—Service life with a constant current output

no longer capable of running the engine. The 40 cells were then connected in single series, which, of course, gave a very high voltage, but would only run the engine for a very short space of time. We then connected the 40 cells four in series and ten sets in multiple and ran at full load for 312 hours more.

With regard to the number of cells to be used in series, it is hard to lay down a definite rule, as the voltage required depends on the type of coil used and the condition of the contact in the timer. A great many coils and timers will operate satisfactorily with four cells in series on a multiple battery and practically all of them will operate satisfactorily with five in each series when connected in multiple. By connecting three or four sets in multiple it is usually practicable to use one less in series than when used in single sets; that is, if a single set of six batteries is ordinarily used, when the multiple connection is made it would be found that five in series is sufficient.

With regard to the number of sets to be used in multiple, the object should be to provide a battery that will run from nine months to a year, and this, of course, depends on the amount of current required and the amount that the engine is run. In stationary engine practice there is a marked advantage, in the fact that the length of contact on the timer can be made just long enough to operate satisfactorily at the constant speed, and this results in a considerable saving in battery current; also changes and adjustment are apt to be less frequent, especially with make-and-break type of ignition apparatus. This means that the manufacturer or user can get a very accurate estimate of the actual amount of current required to operate the engine and can figure on the battery to give a certain amount of service.

In this class of service a multiple series battery of comparatively small size should take care of the ignition requirements from nine months to a year very satisfactorily, provided the batteries were properly protected. To insure the connections being properly made, and to provide the best protection possible, these batteries are now put up in sealed cases with all connections soldered, the cases filled with wax and only two binding posts on top of the battery to which connections are made. These cases are furnished in any size desired. This, of course, makes the battery absolutely waterproof, so that it will stand any kind of weather conditions; there is no chance of loose connections or broken ones, and unless the whole thing is short-circuited in some way, the chances of failure are practically zero. If the engine manufacturer wishes to put up batteries in this way it is perfectly practicable to do so, the main points to note being that the batteries are in proper condition when put in the box; that the connections are properly made and all tight; that the insulation between the batteries is perfect; that the wax is put in at such a temperature that a man can put his finger in it without being burned. The method of sealing, with these precautions, insures the maximum of service from the battery.

THE POSSIBILITIES OF THE LIGHT RUNABOUT

By ROLLAND C. LAURIE

BY "Light Runabout" I mean a car of ample horsepower which naturally will appeal to the man of moderate means. The present runabout of low price falls short of the ideal in horsepower, springing, and general accessibility. The method of distribution of cars need not be through intermediate agencies, but the selling can be direct from the factory to the public. A proposition like this could hardly be handled by intermediate agencies unless the sales of the car were so huge the world over in home and in foreign markets that such agencies as distributing centers could be placed. Why I would wish to emphasize this point is that the suggested design, which I put forward herewith, as to the type of runabout really required, leaves little enough profit to the manufacturer unless these cars were manufactured in very large quantities.

Making in Quantities—Now, as to this question of manufacturing in large quantities. There is not the slightest doubt that the possibilities of business on such a proposition as in an efficient $500 car are absolutely immense. From the writer's knowledge of the subject in connection with a light automobile the information of this subject that can be given to the public and trade alike is that no one at present can have any idea as to the extreme interest aroused in a proposition such as this. One concern alone received some thirty thousand inquiries in less than one year of advertising, such advertisements not being confined to large display, and these advertisements not in any way bringing the proposition right before all the buying public, touching, as it has done, only a certain class of buyer. Another concern has had twenty thousand inquiries for one of their models of light runabout. I could cite other instances from personal knowledge of the trade; therefore the immensity of a business like this can hardly be gauged. The class of buyer to whom this car appeals is the man of moderate means, yet often a man who owns a large car already wants a smaller one for short trips. Again, we have a car which is adaptable for doctors' use, for R. F. D. carriers, and, last but not least, for our very large population of farmers who are gradually becoming interested in the automobile proposition.

As to Design—In the first place, as a general rule, present horsepower is not high enough. The engine should be at least a two or four-cylinder, 15-horsepower, water-cooled type. The water cooling could be easily of the thermo-syphon type; moreover, the simplicity and efficiency of this type of cooling is thoroughly adaptable for use in a small car. In this design of engine we could embody the long stroke, which has become so popular in England and France and has shown such success. The long-stroke engine would mean the delivery of sufficient horsepower for practically every purpose. The change speed gear could be of epicyclic or planetary type, as this design lends itself better in the light car construction than a large gear box. Another thing might be pointed out, that whatever type of change speed gear is employed, it should be strong enough to withstand hard usage. The usual type of planetary gear is frequently deficient in this respect. The final drive could be shaft or chains, just according to fancy of the designer and according to the results shown by trial on these matters.

Chain Not Defunct—It must be remembered that chain is is by no means defunct as an intermediate of power. The Panhard car designers held to the chain as long as they possibly could, for their belief in its efficiency was thorough, and, providing the chain is suitably enclosed in an oil bath gearcase, similar to the British Sunbeam, there is no reason why it should not be a perfect transmitter of power, light and yet free from complication. The shaft drive could be an alternative design, in spite of the fact of the known frictional losses in this form of transmission. The frame could be of pressed steel and the axles of suitable strength. The springs also could be improved upon, as the present day light runabout of low price is, as a rule, extremely deficient in springing. Full elliptic springs seem to give the best results, although they do not appeal to the average man as being mechanical. This is merely a matter for experiment. Probably in this design dual ignition by both battery and magneto should be included. This may sound to the uninitiated as an expensive fitting on such a car, but it can be included in such a price without the slightest doubt.

I cannot deal with the design of such a car more than by giving a rough outline, as every manufacturer has his own ideas on the subject for convenience sake. Three-inch tires should be fitted, either on wire or artillery wheels, preferably the former, of detachable pattern. In this design of car accessibility should be a leading feature, and the price should be right on the $500 mark, neither above nor below, for the car itself. There is no chimerical dream in talking of the possibilities of such a design. It can be accomplished, and the first automobile company that does really accomplish this will corner the market of the world, providing that they put a reliable machine before the public, one that will wear and in which the material is first-class throughout.

Profits Small, Returns Quick—We all know the parable of the grocery store where the profits are small but the returns are quick. In this business it is "small profits and quick returns," and the returns would be so great under the proper management that extraordinary results could be shown in less than two years' working of such a proposition. What is required is "the car for the million," yet it must be a car which can show power, efficiency, comfort, and accessibility.

Every manufacturer has his own ideas as to design of the runabout type, therefore the mere question of design, beyond leading and outstanding features which seem to be most desired, according to the general consensus of opinion from inquirers regarding the light runabout need not be touched upon. By studied standardization a clever designer can manage to produce cheaply. Every part of such a car would have to be standardized beyond doubt. Personally, in runabout design I would be more inclined to favor the sporting, semi-racing type with the seat placed far back—not *too* far, as this has a tendency to give too much vibration to the driver and passenger,

No Rumble Seat—In the first place, the sitting position is much more comfortable, and the car has a more graceful and rakish appearance; and, above this, a rumble seat cannot be fitted. Everyone knows that the runabout of to-day is abused by its owner as a general rule, as single rumble seats are fitted, frequently double rumble seats, the general impression being that as long as the engine has sufficient power to pull a load that is quite enough. Broken springs and other results of overloading do not seem to enter into the purchaser's mind at all; therefore this design of the semi-racing type has something outstanding in merit because a rumble seat cannot be fitted.

The last word which I may say on this question is that the whole matter is one of organization. First, the factory prepared to turn out a standardized car such as this would have to be of such ability that delays in deliveries would be impossible. As for the selling organization of such a factory, undoubtedly the way to place this upon the market in a practical and successful way would be for such a factory to open branches at various distributing points. There are certain cities well known to the automobile trade which form just the suitable distributing basis for such a scheme.

U. S. Automobile Imports—The monthly summary of imports for September shows that during the month 150 automobiles, valued at $291,811, were brought into this country, as compared with 219 imported during September, 1908. For the nine months ending September the figures are: 1909, 1,208 cars, valued at $2,218,414; 1908, 956 cars, valued at $1,803,889. Of the 150 imported in September 74 came from France and 44 from Italy.

Semi-Private Garage of Large and Exclusive Hotel, Is of Shingle and Stucco Construction

CONCRETE answers a larger proportion of the requirements for an ideal garage material than does any other. More than this, the ones which this material fills are of greater importance than those which it does not fill, or in which some other material shows a superiority. Worded otherwise, concrete not only answers the largest proportion of the essential requirements, but evaluating all of these, it has a greater total valuation than any other.

These requirements might be said to be: Low first cost, ease of erection, adaptability to architectural beauty, fire-resisting qualities, damp-resisting qualities, low cost of upkeep, great length of life, cleanliness, and low cost of foundations.

Now, cement or concrete could hardly be said to be very cheap, although, the first cost need not be high and with this medium first cost is more than offset by the fact that the life of the structure is at least twice that of wood, for instance, so the annual figure for depreciation would be but half that of the cheaper place. In addition, cement need not be painted at all, as compared with a coat of paint every other year at the longest for wood, every six months for steel, and other lengths of time for other and different materials, as brick, which should be painted about every three years, etc.

Easy Erection a Very Important Point—Probably the point which, in the case of a small garage, would carry the greatest weight in the selection of the materials would be ease of erection, for this means either less work for the man doing the work himself, or less fuss and bother by the contractor whom he hires. The latter, too, spells less expense. This point should not be borne in mind to the complete extinction of all others, for if it was, all garages would be portables. It should be given its proper value in combination with others.

Hardly anyone, even an enemy of cement, would dispute the fact that cement lends itself very well to architectural adornment, whether carried to the "beauty" point or not. Such features as ornamental corners, in imitation of cut stone, may be reproduced with practically no additional cost for materials. So, too, with details like imitation stonefaced bricks, or stones, a reproduction of field stone, in the introduction of pilasters into the walls, copings around the top edges, the construction of columns, and many other features of worth, these may be had by exercising forethought, and with little if any increase in the material cost.

As to fire and damp resisting qualities, there can be little question but that cement will hold its own. The mere fact that the floors, ceilings, and other parts are made integral with the side and end walls, the finished building being practically one structure, insures a big score for cement on the count of low cost of upkeep, particularly when taken in conjunction with the paint item as previously discussed.

Cleanliness Very Weighty in the Decision—Of all the items, none should carry greater weight than that of cleanliness. This means not alone that the place should look clean and neat when finished and ready for the car, but of greater importance, that it should clean easily afterwards, when old and easily dirtied. In this connection, it is enough to make out a case for cement, to say that the only thing needed to clean a cement garage and that, too, easily and quickly, is a hose and a source of water supply. Rubber boots will come in handy too. Of course, water can be used in the same way to clean out frame garages, stone or brick buildings with wood floors, and other kinds of motor houses, but it is by far the easiest to clean out an all-cement house, with cement floors, of course.

Cement Block Garage for One Car Is Low in Cost

Being heavy in weight, the concrete or cement place would need heavier or stronger foundation than the frame building, while the stone and brick building with cement floors stand about on a par with the all-cement house in this respect. However, even in this, the latter possesses an advantage, for the foundations are laid more readily and should

A FEW ASSORTED QUESTIONS

Editor THE AUTOMOBILE:

[2,087]—My tail lamp constantly jars out. Can you give me information about an oil that will burn in an ordinary kerosene lamp and not jar out, or a burner that can be used and which will not jar out?

If the stems of the valves on an automobile engine are worn so that the space between the valve stem and the valve lifter is one-eighth of an inch (⅛), what effect would this have on the power of the engine?

A mixture of gasoline and air, 1 to 6, according to a handbook, gives about the same power as a 1 to 9 mixture. If I understand this correctly, one gets more power out of the same gasoline at a weak mixture of 1 to 9 than 1 to 6, or are there other conditions that overcome this advantage?

Can you inform me if the acid used in the acid cure for tire repairs is acetic acid, and does it injure the rubber of the tire?

Would the valve stem shortage previously mentioned cause a pounding on hill climbing?

Can you give me the age which an automobile is expected to wear and run in good condition? Also, what repairs or parts are most likely to give out first and put the car in such shape that it would not be worth while to put it back into running order?

Nichols, Conn. W. T. K.

To answer your many questions in order, we have never heard of a lamp, burner or oil for an oil lamp which would not jar out as you describe under sufficient provocation. Your only hope, if you feel that you must have something different, lies in electric lights, which, properly installed upon the car, would include side lights and tail lamps as well as the more usual searchlights.

Relative to the second question, the large space between valve stem and lifter will not influence the power except indirectly, although it will make an engine very noisy. The way in which it will influence the power is this: when the adustment is used to reduce the space and with it the noise, the timing of the valves will be altered slightly, and this slight alteration may be such as to change the power. For instance, the engine might have a rather late exhaust closing, which the adjustment would make still later. This, then, would cause the motor to heat and thus lose power. Similarly, the adjustment for the inlet valves might cause them to close either too early, making the charge incomplete, or too late, so that some of the charge was lost, also making it incomplete.

As to your fifth question on the same subject, the pounding on hill climbing could only be caused by the changing of the adjustment as just described. That is, it would not result from the simple too-large space, as long as the space was left unchanged.

Your understanding of the power and economy of a weak mixture is correct, but the reason why this cannot be used at all times is that an engine will not pull up a hill in sand, broken stones or other hard going on a weak mixture. On those occasions one must use a rich mixture or the engine will quit. So it is that the economy of the 1 to 9 mixture cannot be utilized at all times. On page 750 of the October 28 issue of THE AUTOMOBILE, you will find something on the same subject which may interest you. The figures there given are in percentages, however, and for your personal use, we have reduced these percentages to ratios, as follows: 15 per cent. is a 1 to 5.66 ratio; 5.5 per cent. is 1 to 17.2; 4.0 per cent. is equal to 1 to 24.0; 1.9 per cent. is 1 to 51.6; and 2.4 per cent. is 1 to 40.6. These, however, refer to gasoline vapor, not gasoline liquid.

The acid used in the acid cure for tire repairs is not acetic acid, which is the principal constituent of vinegar. The acid used does not harm the rubber.

It is hard to say what age automobiles are supposed to reach. We can only give you some figures on ages of cars which we know to be correct. Thus, in Buffalo, N. Y., there are many old Pierce cars dating back more than five years. Of these there are quite a few of the 3 1-2 horsepower motorettes, which were built in 1902, and consequently are 7 1-2 years old. There are many of the 6 1-2 horsepower stanhopes and still more of the 8 horsepower stanhopes, built in 1903 and 1904, respectively, making them each 6 1-2 and 5 1-2 years old.

The writer has a close friend in Detroit who owns and still runs a single cylinder Packard. As this firm moved to Detroit in 1903, and built no single cylinders in the new shop, this car must date back to the Warren, O., plant, which means that it is from 6 1-2 to 7 1-2 years old. Again, the writer knows of an old two-cylinder Winton, built in 1902 or 1903, which is still doing yeoman service in Eastern Pennsylvania. This car, in fact, climbed a steep hill which automobilists ordinarily dodge, with five heavy passengers on board, without a particle of trouble. At the time this was done the car was five years old, and now is about 6 1-2 or 7 years.

As all of these cars were built early in the automobile business, before the advent of superior materials, and really before the days of very fine workmanship, it is reasonable to suppose that a good, modern, well-built car should last from ten years on up, according to the care it receives.

The repair parts necessary would also vary with the use, but, off hand, it would seem as if running gear parts and bearings would go first. Transmission and other gears see severe service and would doubtless follow the bearings, while such parts as cylinders, flywheel, crank and gear cases, frame, etc., should last indefinitely.

Of course, these cars have all had the benefit of careful driving and skilled attention whenever necessary. Such handling should be taken for granted in calculating the life, for an automobile is, after all, a piece of machinery, and should be treated as such to secure the best results. If you buy a 1910 model of reputable make, and treat it well, it should be running in 1920.

CENTRIFUGAL PUMP OUTPUT

Editor THE AUTOMOBILE:

[2,088]—In your article on radiators in the issue of October 21, speaking of centrifugal pumps, you say that in a certain test 680 r. p. m. was found to be the speed of impending delivery, and conclude that the quantity of water handled by the pump at any lower speed is negligible. However, in the cooling system of an automobile we have a closed circuit of water, and the only head to be dealt with is that due to friction, so I think it will be found that the pump handles a considerable amount of water even when the engine is running slowly. I drive a car in which the pump, of the centrifugal type, runs at about the same speed as the engine, and a vigorous circulation takes place when the engine is idling, close throttled. EARLE A. RYDER.

Ithaca, N. Y.

Granting all that you say, because if the pump did not circulate some water at low speeds it would be dangerous to run the engine at those speeds, we still think that our remarks in the issue and article mentioned were perfectly correct. Since the lowest speed possible with a normal engine is 300 r. p. m., and in the usual case, even this is not approached, 400 being more nearly correct, it would appear as if the speed of pump previously mentioned has been closely approximated.

In this connection, we wish to call attention to the fact that not one person in a hundred can judge slow speeds of an automobile engine correctly. To prove this contention, we will cite an example. The writer knew a man engaged in automobile manufacturing, previous to two years of which he had been engaged in automobile repairing for about five years. This man built his own engine and claimed that it would run at as low a speed as 200 normally, and could be made to run at 160 if desired. The writer called his attention to the fact that the engine would not do this, and after much discussion a speed indicator was called into play. The very first time this showed 450 r. p. m. On the second trial with the engine apparently running much slower, and the manufacturer very confident, the figures were 435. The trials were continued for a whole day, and not once was this manufacturer able to go below 388, the low figure for the day's work. Yet he had been in the automobile business for about seven years.

Similarly, a driver who prided himself on the slow speed at which his engine would run, due to changes he had made in the throttle of the carbureter, was asked by the writer to run his engine as slowly as possible. When he had done so, and estimated the speed at "about 240 revolutions," the speed counter showed it to be 425. He hastened to make a few changes, and confidently asked to have it counted again, saying "it is running about 250 now." The counter figures were 410.

RELATION OF POWER: SPEED

Editor THE AUTOMOBILE:

[2,089]—I have a runabout of the high-wheel, solid-tire type, a standard make of its kind. Ordinarily it is a speedy and serviceable vehicle. It is rated 12 H. P., and by the formulas figures 13.5 H. P. Its weight is about 1,000 lbs. Recently my wife and I were crossing a bridge, and at the point of leaving the bridge there is rather a steep downgrade. At this place for a distance of two or three rods there had been spread a fresh coat of broken limestone five to eight inches deep. The stone had been spread but not rolled down. On going off the bridge down grade on the high speed, the engine stalled within a few feet of the end of the stone repair. Returning later, we took the obstruction up grade with the low speed, and with the throttle and spark as far advanced as it would bear. The machine stopped at about the middle. I had the humiliation of seeing two buggies, each drawn by one horse and each carrying two men, pass me with no great difficulty; also a cab with two horses, the driver and four passengers. With my wife at the wheel, I got out and pushed; and, although I am far from being a Hercules, we pulled up on the bridge and the trouble was over. A few minutes later the machine went up a long, steep grade on the high speed and without faltering. Now, wherein was the 12 H. P. engine at a disadvantage with the one and two actual horse-power buggies and carriage?

Columbus, O. A SUBSCRIBER.

The secret of your trouble in this case, the same as that of many other automobilists in similar cases, lies in the relation of power to speed. This sounds like a puzzle, but it is not. The torque (which is a technical name for turning force) of the motor is always the same at the same speed. This, however, is delivered to the wheels at varying speeds, and although you may not realize it you yourself appreciate that the torque is greatest at the slowest speed of the wheels. It is for this reason that you come down to low speed to climb hills or to pass through broken stone, gravel or the like, all of which are conditions that require a large torque.

Perhaps it will be more simple if put into figures. Thus, suppose that the engine develops 12 horsepower, as you say. Suppose, further, that at high speeds, equal to 12 miles per hour, the torque exerted at the wheels is 200 inch-pounds. Then suppose, further, that the low speed is just half of the high, or 6 miles per hour. At this speed of the vehicle, with the engine running just the same speed as before and developing just as much power, the torque at the wheels will have been increased to twice what it was before, or 400 inch-pounds.

Again, if it were possible to equip your car with a third, still lower speed of, say, half the present low speed, making the velocity of the vehicle at that speed 3 miles per hour, the torque at the wheels for the same engine power developed at the same engine speed would be twice the previous example, or 800 inch pounds.

This explains the failure of the machine in part to negotiate the gravel-covered road, that is, the lowest speed of the vehicle which your gearing allowed was not sufficiently low for the engine to pull the car through, as it would have done had you possessed another and still lower speed.

There is another side to this, and that is the ability of any animal to exert an unusual amount of power for a very short time, a thing which no machine, other than the electrical motor, can do without internal changes, and which very few machines can do with any kind of changes. That is to say, that machines have a fixed output, beyond which they cannot go, but the same is not true of animals.

So, it might be said with truth that the horse in question, under the urging of his driver, doubtless exerted many times the equivalent of one horsepower for the few short seconds occupied in passing through the stone pile.

The same thing is doubtless true of yourself, urged on by your humiliation, you doubtless exerted a power equivalent to several horsepower for the very few seconds in which you were pushing to help the engine along. Do not feel that this trouble is confined to your type of car alone; 40, 50 and 60 horsepower machines have been known to be stuck under similar situations, their gearing being such that under the unusually severe demands of, say, deep sand, the motor was unable to develop a torque at the wheels which was sufficient to pull the car out.

On the other hand, to gear the car down for these unusual requirements, that is, so low that no hill or sand would stop the car, would render the usual driving anything but pleasure, or else would call for a new type of gear box with five or six speeds, the last two being so low as to be practically a crawl. These would be emergency speeds, and the extra weight would have to be carried all of the time, for a possible use once a year. The question then arises, would this be worth while?

COLD WEATHER COMING

Editor THE AUTOMOBILE:

[2,090]—Will you kindly inform me whether a thin, light oil that will not congeal at zero can be used in the cooling system of an automobile having a water pump? Also, would the use of kerosene be practicable?

Boston. G. E. ROGERS.

The kerosene idea was taken up in last week's issue. We do not advise its use. Light mineral oil, of the grade known in the trade as refrigerating oil, makes a very good winter cooling medium. This is the oil used for ice-making machinery.

INJURIOUS EFFECT OF OIL

Editor THE AUTOMOBILE:

[2,091]—I have read with interest your remarks on non-freezing alcoholic mixtures for the radiators of motor cars during the cold weather. The principal and about only objection to the use of alcohol is its rapid evaporation, and I have thought that this might be overcome to some extent by putting a film of some light lubricating oil on top of the mixture in the radiator. I do not think that the oil would circulate and could therefore have no injurious effect on the rubber hose connections.

Have you any knowledge of this being tried, and would there be any objections to put a small amount of oil in the radiator as above suggested? H. L. D.

Nyack, N. Y.

As was brought out in answer to a letter last week, the principal trouble which oil in the cooling water causes is that due to reducing the radiating ability of the radiator. The oil forms a thin film over the whole surface of the radiator, and reduces the capacity of the latter to about one-third of its usual capacity. This is because oil is a poor conductor of heat, and also because of the thin layer of air which will be caught between the oil film and the metal, the latter being a non-conductor of heat. Since the cooling capacity of the radiator is figured very close so as to keep the weight down as low as possible, a reduction of two-thirds is serious.

The immediate result of this would be to make the motor heat up very quickly, since the heat could not be conducted away fast enough.

We have never heard of this being tried and certainly would not advise it.

Even if the aforementioned effect on the cooling ability of the radiator and therefore on the whole system was not as outlined above, how do you make out that the oil would not circulate and attack the various rubber connections? Certainly, even if the oil floated on the top of the water, when the latter circulated around through the water jackets the oil would not stay where you wished it to, but would circulate also, and nothing that you could do would prevent it.

MATERIALS FOR BALLOONS

Editor THE AUTOMOBILE:

[2,092]—Can you give me the address of a maker of gas bags for balloon purposes, or of materials which could be used for these things? H. J. NEWMAN.

Goshen, N. Y.

We cannot give you the name of any balloon makers, but several makers of cloth of a special weave for use in balloons and aeroplanes are available.

For this purpose, a fabric is necessary which combines strength and extreme light weight with waterproof qualities. Silk answers most of these, and so the basis of most of the special cloths is a silk. This is usually coated inside and out with a very thin coating of pure rubber.

Such a fabric is made and sold by the Continental Caoutchouc Company, the makers of the well-known Continental tires. Another maker is Glenn Curtiss, who is said to have invented a new fabric which excels all others. You can reach him at Hammondsport, N. Y.

Fig. 1—Model 50 touring car with seven-passenger body, a wide entrance, flaring mud guards and a business-like get-up

MISHAWAKA, IND., Nov. 8—Differentiating between the fullest measure of success and a scant existence, so to speak, is attended by difficulties on occasions, due to a similarity of features and lack of exact knowledge. In discussing the two-cycle motor, as it is used in automobile work, this problem in differentiation becomes acute, and the only way, perhaps, to ascertain the bottom facts is to show what has been done.

It was but a few short years ago that designers were wont to claim that none but electric vehicles would ever reach a high level, and all forms of internal combustion motors were looked upon as far too complicated to be placed in the hands of average users of vehicles to use for transportation purposes. Fortunately, men who do things declined to be led by the nose, and they went right on experimenting with internal combustion motors, with the result that the success of the electric type of car was no more than assured when the gasoline type entered the race for popular favor.

Four-Cycle Motors Were Perfected First—The four-cycle type of motor offered the least resistance, and it reached a high state of perfection first. This is in spite of the added mechanical complication, which goes to show that it was not a question of mechanics at all. As might have been expected, it was easier to assure a competent firing charge in a four-cycle motor for the very reason that the mechanical displacement of the burnt charge is the surest way of scavenging.

This easy gain was a fortunate circumstance, considering the class of men who want "dividends" on efforts at once, but it was no proof of lack of ability of the two-cycle motor. As a matter of fact, the very class of men who jumped to the conclusion than only the electric would serve in the long run, repeated their short-sighted dictum when the four-cycle motor fought its way to recognition, and now that the two-cycle motor is commanding respect, these prognosticators will again have to bow to the type of man who works and struggles, the courage of sound conviction being the incentive.

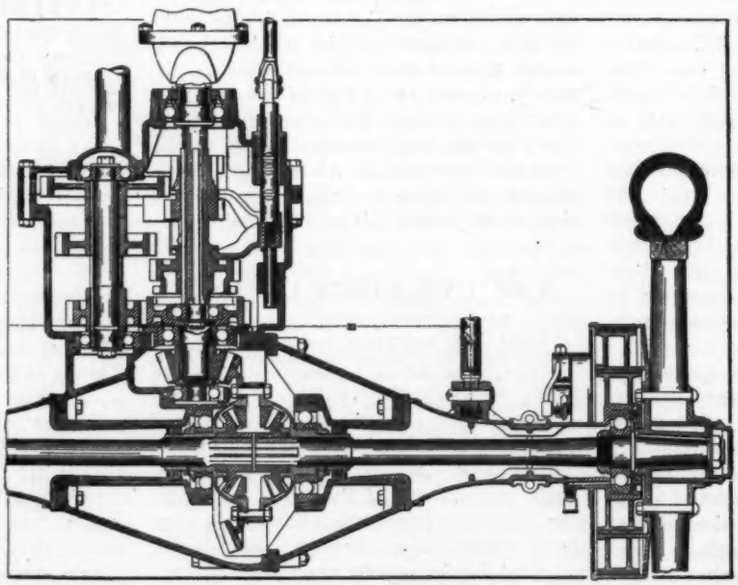


Fig. 2—Live rear axle with attached transmission, sectioned to show annular ball bearings, floating shafts, double brake drum and general details

Two-Cycle Three-Port Motor Offered Greatest Resistance—Strange to relate, the three-port type of motor, which is mechanically the most simple of all, offered by far the greatest resistance, thus again showing that mechanical problems were the least troublesome, and that the designer had to cope with many problems the nature of which were "thermodynamic," and to a vast extent speculative.

Many Failures Charged to Wrong Mechanism—When a car, as a whole, fails, the question is, what part of the car is responsible for the failure? Is it the motor, clutch, transmission, axles, wheels, tires, or does each unit contribute a quota? In the past it frequently happened that failure was due to lack of ability of the structure as a whole; each element contributed a share of the trouble, and the owner of the car, not knowing where to center responsibility, charged the whole of the failure to some one part, and why not the motor, especially if it differed from the general run of motors?

In this way many of the earlier four-cycle failures, so-called, were charged to the motor, when, in all truth, the chassis would not properly serve, even with electrical equipment for the motive power, and later on, when two-cycle efforts were made, it did not occur to any one to ascertain if the trouble was not due to inferior chassis construction, rather than for want of a good motor. These failures to discrim-

inate as between the sources of trouble resulted in placing all of it on the relatively new unit, as the two-cycle motor, and delayed recognition of undoubted quality was a natural sequence, and to be expected.

Two-Cycle Motor Hampered by Environment—All the earlier applications of the two-cycle principle were in connection with boat propulsion, and single-cylinder motors were used in almost every case. In the single-cylinder type of motor it was not difficult to render the crankbox tight, and the primary compression which took place therein was not difficult of attainment. The little motors were so simple and they worked so well that thousands of them were designed and constructed, but, unfortunately, the class of workmanship was generally below a fitting standard, and when this class of work was put into multi-cylinder motors for use in automobiles, the motors failed, simply because they were mechanically incapable of sustaining in the more difficult service.

There is no doubt about the abstract ability of a steam engine, and yet, were many of the steam engines now being built mounted on the frame of a locomotive, they would fail in service. This illustration is apropos; failure, when it is encountered, may be due to a malapplication of a principle, rather than to the principle.

Simplex Three-Port Two-Cycle Motor—The three-port type of two-cycle motor is absolutely valveless; the mixture enters the crankbox through a third port; it is there compressed by the descending piston just as in the two-port type of two-cycle motor, and in both types of two-cycle motors, as well understood, every descending stroke of every piston (referring to a vertical type of automobile motor) is a power stroke. This cyclic relation must be appreciated to understand the reason for desiring to adopt the two-cycle principle; in a four-cycle (automobile) motor every second downward stroke is a power stroke.

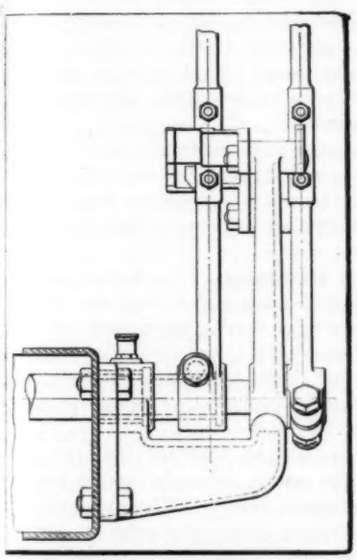


Fig. 4—Section of chassis frame just in front of side lever bracket

It will be understood, then, that a two-cycle motor, with either two or three ports, is designed to deliver twice as many power strokes per cylinder, per thousand revolutions of the crankshaft, as can be realized from a four-cycle motor of the same number of cylinders. Obviously, with the same bore and stroke of cylinder and piston, respectively, if the mean effective pressure can be made the same in the two-cycle as it is in the four-cycle type of motor, the power which can be delivered from the two-cycle motor will be double that of the other, per thousand revolutions of the crankshaft, in common time. To accomplish this has always been the aim of the two-cycle designer, and an immense amount of energy has been expended on the subject by innumerable inventors.

It has never been shown that the two-cycle type of motor is capable of delivering double the power realized from its cousin, the four; the mean effective pressure is not the same in both, and it is even a question if some of the inferior designs of two-cycle motors are capable of delivering as much power as is usually realized from average designs of four-cycle motors.

Taking the motor as made at the plant of the Simplex Motor Car Company, at Mishawaka, Ind., as an example, it will be possible to discuss the subject further, and with this concrete example at hand, determine with far greater certainty the facts and the trend. The car, as made by this company, is shown in Fig. 1, the specifications of which are as follows:

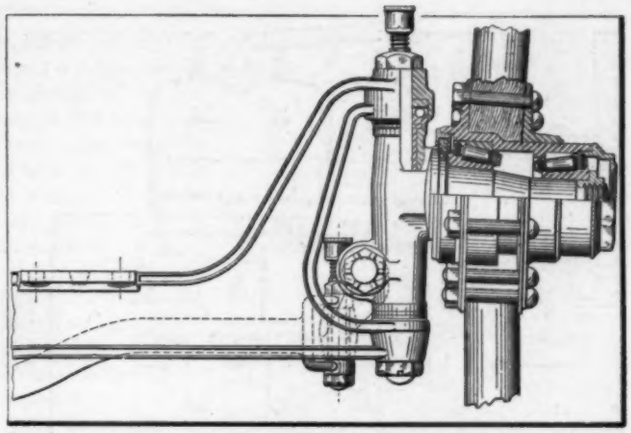


Fig. 3—I-section front axle, looking at the front, cut away to illustrate Timken roller bearings in front wheel hub and ball bearing knuckles

SPECIFICATIONS OF AMERICAN SIMPLEX AUTOMOBILE

Data of the Motor

Number of cylinders	4
Bore	5-in.
Stroke	5-in.
Normal speed (revolutions per minute)	900
Rated horse power	50
Ignition	Dual
Principal source of electricity	Magneto
Emergency source of elecricity	Storage battery
Carburetion	Automatic
Cooling (centrifugal pump)	Water
Lubrication	Force and splash
Cylinders	Gray iron
Crankcase	Aluminum

Data of the Chassis

Wheelbase (touring)	117-in.
Wheels (wood)	Artillery
Tires (front)	36 x 4 in.
Tires (rear)	36 x 5 in.
Chassis frame	Channel steel
Steering gear	Gemmer
Springs, front and rear	Semi-elliptic
Front axle	I section
Rear axle	Live
Front wheel bearings	Timken
Rear wheel bearings (D.W.F.)	Hess-Bright
Transmission	Shaft drive
Speeds	3 forward; 1 reverse
Location of transmission gear	Suspended from rear axle
Clutch	Disc
Clutch facings	Steel on gray iron
Clutch location	In flywheel
Brakes; two sets (constricting)	Drums on rear wheels
Muffler	Special design
Spark and throttle levers	On steering wheel

Note—The specifications as above given, while they apply to the touring car, are, with slight exception, applicable to the several other models, as close-couple, limousine, and touring roadster.

Separate the Chassis from the Motor—An intelligent discussion of the merits of the valveless two-cycle motor will not be possible unless it can first be shown that the chassis and the remaining units are competent, free from trouble, and by a system of elimination bring all troubles home to the motor, if such there are.

Since the live rear axle and the transmission are important members, capable of inducing a deal of trouble if they are not rightly made, it is proposed to present reproductions of working drawings and, to the greatest

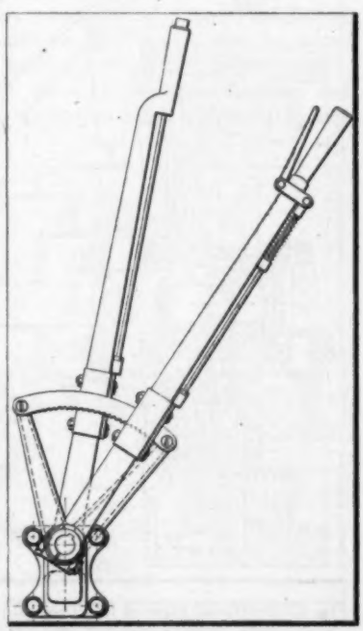


Fig. 5—Plan of side levers, quadrant, and details of design

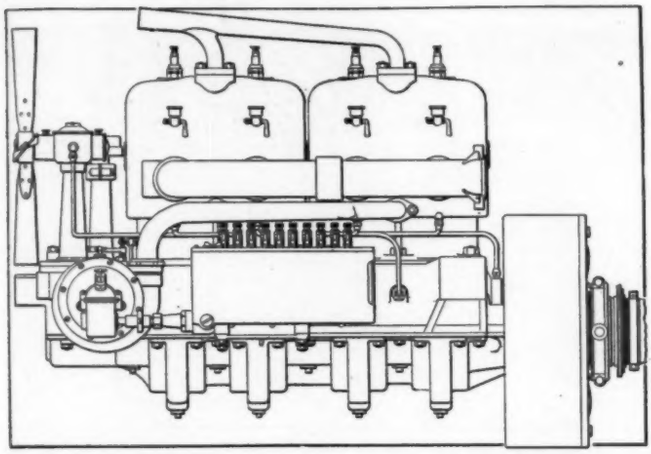


Fig. 6—Elevation of the two-cycle three-port motor with oiler exposed, fan in place and flywheel covering the clutch

possible extent, show that trouble from this source is scarcely a remote contingency. Fig. 2 shows these important members in section, with the left wheel and part of the axle broken away, since both sides are symmetrical, and the reproduction will be on a larger scale, hence more clear. The live shaft floats on Hess-Bright ball bearings; the hub of the wheel is drawn up on a taper, and the termination in the differential gear for each shaft is enlarged and fluted, thus assuring competence and ease of assembling. The wheel is prevented from floating off by the closure ring of the large annular type bearing, just inside of the hub of the wheel, on each side, nested within the drum of the brakes.

The wheels are made with large section spokes, of which there are twelve, and the brake-drums are bolted to the hub-flanges, provided with mud excluders, and each set of brakes is provided with individual flanges. The spring perches rotate on bearings, hence there is no binding tendency when the springs

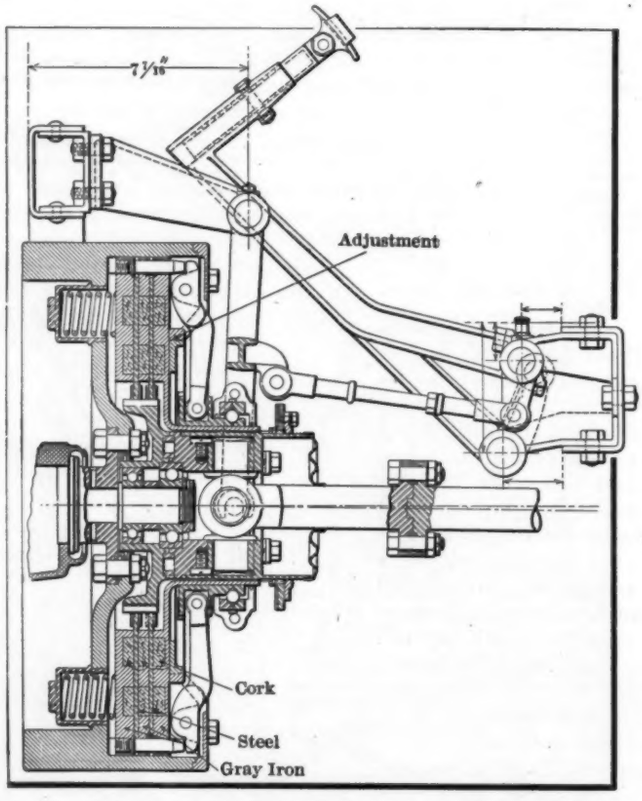


Fig. 7—Sectional view of flywheel and clutch, illustrating multiple disc clutch, controlling mechanism and details

deflect, and inside of the springs, at a point of vantage, the radius rods are anchored, they being of nickel-steel tubing, and the bearings at the anchorage are provided with ample surface.

The differential gears are of the bevel type, made of special (low metalloid) 15 carbon steel, cemented and hardened. The differential gears and housing are provided with liberal bearings, and the bevel drive, the gear of which is bolted to the housing, is of liberal proportions, with annular ball bearings at every point, including an outboard bearing for the pinion. Closure rings, with three grooves, prevent lubricant from migrating out, and silt of the road is debarred from entering.

Transmission Gears of Great Strength—The aluminum housing for the transmission gears engages the housing of the live rear axle in such a way as to form an integral part thereof, and short shafts, of liberal diameter (drive and lay), are suspended in annular ball bearings. The direct drive is worked out in a manner to be commended, a 24-teeth internal gear being used for the purpose, and a No. 406 Hess-Bright ball bearing is placed at the end of the shaft, within the gear, to take the load. The materials used are of the best obtainable in alloy steel.

Front Axle Up to a Fitting Standard—Referring to Fig. 3, it will be observed that the front axle is of the I-section, forged in one piece, and the knuckles are also die forgings of special steel, annealed and accurately machined. The knuckles are long, provided with liberal bearings, and the thrust is taken on a ball bearing at the top. The front road wheels are of special design, with liberal spokes, and, like the rear wheels, the wood is second-growth hickory, seasoned and selected with a view to casting out "bastard" and defective wood. Timken roller bearings are used in the front road wheels, it being the desire to thus provide for thrust.

The steering links are of nickel-steel tubing; balls for ball and socket joints are large, securely placed and adjustable. The steering arm attaches to the knuckle in a secure and proper manner, and the shape is such that the links are nested above and to the rear, out of harm's way.

Other Substantial Chassis Evidences—The chassis frame, as shown in section in Fig. 4, is 5 x 2 x 3-16 inches, of a special selection of material, and affords a wealth of rigidity for the intended purpose. Despite this ample frame, the machinery is securely mounted and universal joints are placed to take the effect of road inequalities at every point, one of which is shown at the end of the shaft in Fig. 2.

Referring again to Fig. 4, it will be observed that the side levers are securely related to the frame, an ample bracket (made of a steel casting) being used for the purpose. The levers, which are of a nice design, are depicted to better advantage in Fig. 5. These levers are of die-forged steel, fashioned to enhance the general appearance of the car, as well as to serve for sliding the gears and applying the emergency brakes. It would be possible to show, by means of additional working drawings, that the chassis and its relating units are quite up to the most fitting requirement, and since the whole car is made at the most Simplex plant, under the direction of the one corps of engineers, uniformity is a reasonable expectation.

Motor Is Not Handicapped—Any further discussion of the motor will be with the understanding that it is not required to shoulder the blame of an incompetent chassis, and under such conditions if it fails to perform in a satisfactory manner it is the motor that will have to serve for the explanation.

The general design of the motor is shown in Fig. 6, and owing to the entire absence of valves, it looks quite different from motors in general. The flywheel is rather large as it shows, but glancing at Fig. 7 will suffice to indicate the reason. The clutch, which is housed in the flywheel, is of the multiple disc type, with steel discs, of which there are two, pressed by means of four springs against cork inserts in gray-iron mates. The maximum spring pressure is about 200 pounds, and by means of an adjustment, as shown, the discs may be brought into more intimate relation if, perchance, wear creeps in.

A universal joint is placed within a shell in front of an assem-

bling joint in the shaft, and a distance rod takes all pressure when the foot pedal is pressed to relieve the clutch. The whole mechanism is housed in the flywheel, and the face of the same is more than usual on this account, although the actual weight of the flywheel is well within the realm of good practice.

Fan and Starting Crank Details—At the front end of the motor the fan used to draw cool air through the radiator is fashioned in conjunction with a pedestal, which also serves to house the fanshaft, which engages a lateral shaft through a spiral gear, thus eliminating the belt as ordinarily used to drive the fan. The fan rotates on ball bearings, is placed horizontal, and a bevel drive makes the right-angle transmission. The starting crank emerges from the casing, and the driving jaws are enclosed in the housing. The crank is broken off, but the detail is sufficiently clear to indicate care in the designing, and that the two-cycle principle is not harassed at this end of the motor.

How the Accessories Are Arranged—Glancing at Fig. 9, the cross-shaft previously referred to will be seen, and the accessories are driven through this shaft, which takes its rotative ability from the crankshaft by means of a spiral gear system, with one member keyed on to the crankshaft as indicated. The water circulation pump is of the centrifugal type, and its shaft passes in through the wall of the housing and engages a safety (flexible) joint, through which the power is obtained.

The timer passes up, is driven by a bevel gear set, and is in an accessible position when the power plant is placed in the chassis. The magneto drive is shown to the left, and a sliding (floating) shaft, equipped with a bevel drive at the magneto end, engages with the spark advancing mechanism, a section of which is clearly given. The whole equipment is suitably enclosed, grease cups are provided at all points and, in view of the methods employed, noiselessness of performance is a normal expectation.

Crankshaft Tells Its Own Tale—Referring to the crankshaft, Fig. 10, it is to note that it is relatively light, is drilled out with 7-8-inch holes, with an outside diameter (uniformly) of two inches. The cheeks are quite thin, 11-16 inches, and the arrangement of the cranks is that of a pair of two cylinder crankshafts (rotated 180 degrees) with an angular displacement of 90 degrees between the pair. The firing order is 1-3-2-4, and in view of the unbalanced arrangement of the cranks, balancing discs are placed over the throws.

The use of balancing weights may seem to be disadvantageous, but it must be remembered that the crankcase compression must be maintained as high as possible (about seven pounds in this motor), and the weights are used to fill up the crankbox, as well as to balance the crankshaft, it being the experience that the crankshaft is not sufficiently out of balance to give any trouble at all at the best power speed of the motor.

The crankbox compression is brought up to the high point named by having the space quite completely filled, and tightness, which is difficult to attain, is brought about by means of split, mitered, packing rings, with springs behind them, and since they are ground, and press against ground faces of the cheeks of the crankshaft, they are not only tight, but experience has shown that they will stay so.

To afford bearing surface for the packing rings, the cheeks of the crankshaft are made thin and wide, and in view of the continuous but relatively smooth series of twisting moments afforded by the motor, the crankshaft, as designed, serves the purpose perfectly, and of the considerable number now in use a failure is as yet to be recorded.

In this very crankshaft construction is to be found a large part of the success of the motor; it has long been known that two-cycle motors can be made to work if the crankbox compression is maintained,

(A) At or near seven pounds per square inch;

(B) The same in every chamber of the crankbox;

(C) Despite the inroads of service long continued.

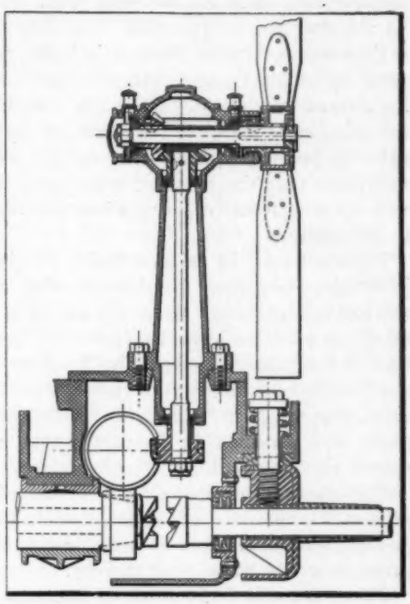


Fig. 8—Section of front end of motor and fan, presenting method of driving and details of the starting crank

Power Delivered Is Very Satisfactory—The A. L. A. M. rating of a 5 x 5-inch, bore and stroke respectively, four-cylinder, water-cooled, four-cycle motor is determined as follows, remembering that this is approximate, for comparison:

$$\text{Horsepower} = \frac{d^2 N}{2.5} = \frac{5^2 \times 4}{2.5} = 40$$

The above is about all that can be expected from a motor of the conventional order, and, taking the average of motors, it is too much to say that all will do so well.

The two-cycle motor, as here described, claims the distinction of delivering (under the same conditions of test) between 50 and 65 horsepower; it is better to consider a range of the delivery figures, perhaps, than to state the maximum.

All that has been shown so far is that the design is on a high plane, the workmanship is that of a well-equipped shop, and a single, well-directed corps of engineers has the whole situation in hand.

One of the points to be taken cognizance of is the high compression of the cylinders, it being about 90 pounds per square inch, absolute. All the cylinders are ground, even over the domes, which are flat, in order to assure equality of compression in the respective cylinders. Then, the pistons are provided with deflectors that could only have been arrived at after much experimenting. The ports, of which there are four for the inlet and exhaust, are wide and about 1 1-4 inch in depth, and the radius of

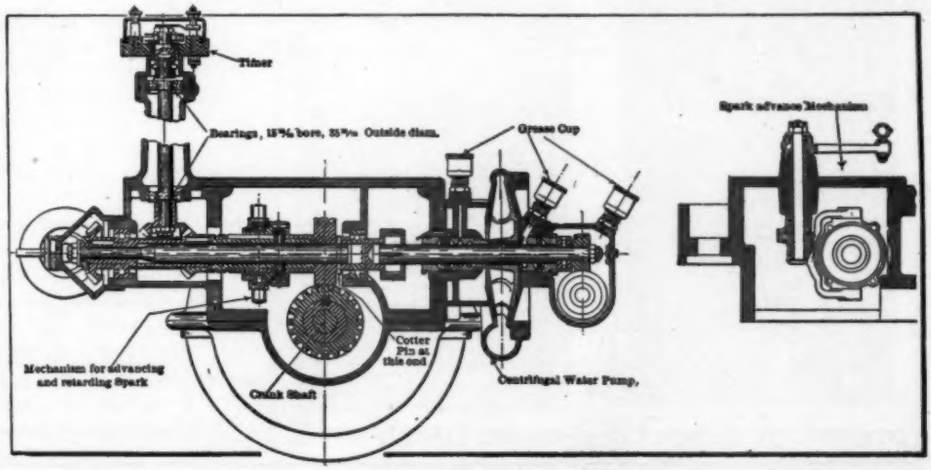


Fig. 9—Section of crankcase at lateral shaft, depicting water pump in section, drive for magneto and method of advancing the spark

the deflector, as it sweeps away from the cylinder wall, is about 1 1-2 inch.

Between each port there is a baffle fin on the deflector, the function of which is to prevent the incoming mixture from sneaking around over the surface of the piston head and mingling with the escaping exhaust. The baffle is on the inlet side, and the exhaust ports are about half of the depth of the inlet ports wider, so that the exhaust opens early, and the terminal pressure is very much reduced when the inlet ports are uncovered by the piston.

The inertia of the exhaust under the given conditions of escape is sufficient to prevent crankbox fouling, and the bridges between the exhaust ports are water cooled. The piston rings are about of the same dimensions as those used in good water-cooled motors of the four-cycle type, and it has been determined that they are less likely to fall into the ports than they would be were they as wide as the ports. The bridges serve to guide the rings by the ports, and it cannot be discovered that there is any trouble attached to this detail.

The transfer ports are much restricted, it being a matter of skill to fix upon the minimum possible cubical volume of them; any excess would serve as a detriment, since the crankbox compression would be reduced thereby.

Other Details Contribute to Success—The idea involved in maintaining a high compression is to make the mixture as inflammable as possible, taking into account the possibility of incomplete scavenging, due to the short time the gas has to pass out, especially when the speed of the motor is high, it having been determined that even 1,800 revolutions per minute is well within the range of practice. Even if the mixture is contaminated, if the compression is increased to match, it will burn readily. To add to this assurance, the spark is so contrived that it may be advanced as much as 60 degrees; in four-cycle work the spark is rarely advanced more than 38 degrees.

In order to be able to advance the spark fully 60 degrees, the mechanism, as shown in Fig. 9, was contrived, and it offers the advantage of bringing the armature of the magneto in the position of maximum energy at all points in the range.

Some Conclusions to Be Reached—Instead of following in the beaten path of four-cycle designers, if success is to reward two-cycle efforts it seems to be necessary to depart from them sufficiently to satisfy a series of modifications of the laws which govern the situation, among which the following is a resumé:

(A) The crankbox compression must be maintained with great precision between the respective chambers.

(B) The cylinder compression must be high enough to assure that even an inferior mixture will ignite and burn with sufficient speed to deliver its energy to the receding piston before it reaches the end of the stroke.

(C) The ignition system must be contrived with a considerable increase of the range of spark advance, in order to ignite slow-burning mixtures in time to take advantage of the energy component.

(D) The carbureter, especially in three-port motors, must be particularly capable, and in the case in point it was necessary to utilize the automatic principle and divers modifications of common practice.

A Fallacy Seems to Be Disclosed—Just because there are no valves required on a two-cycle motor, many embryo autoists came to the conclusion that it would cost next to nothing to build a good automobile; they failed to remember that the motor represents only about 25 per cent. of the whole undertaking, and it did not occur to them that motors are quite well behaved, as a rule.

In going into the matter with this idea of simplicity, they made the chassis, transmission, and other parts so simple that they failed to work, and then, not being capable of analyzing the trouble, it was a simple thing to apply the faults of construction to the motor and to relieve their pent-up feelings, cry it from the housetops. In the meantime, with a well-designed and constructed chassis, capable of serving with any kind of a motor that will deliver enough power, it has been found that a two-cycle motor, without any valves at all, is capable of doing the work reliably, and since there are double the number of twisting moments in a given time (comparing with a four-cycle motor), the power is delivered with the facility of a continuous flow, and the actual fiber strain of the members of the motor and the chassis is reduced.

Great Southern Incorporates—Articles of incorporation have been filed by the Great Southern Automobile Company, of Birmingham, Ala., which will erect a plant and manufacture cars at Ensley, near that city. The authorized capital stock is $100,000, of which $93,000 is subscribed. The officers are E. F. Enslen, president; Ike Adler, vice-president; John Kyser, secretary and treasurer, and E. F. Enslen, Jr., general manager.

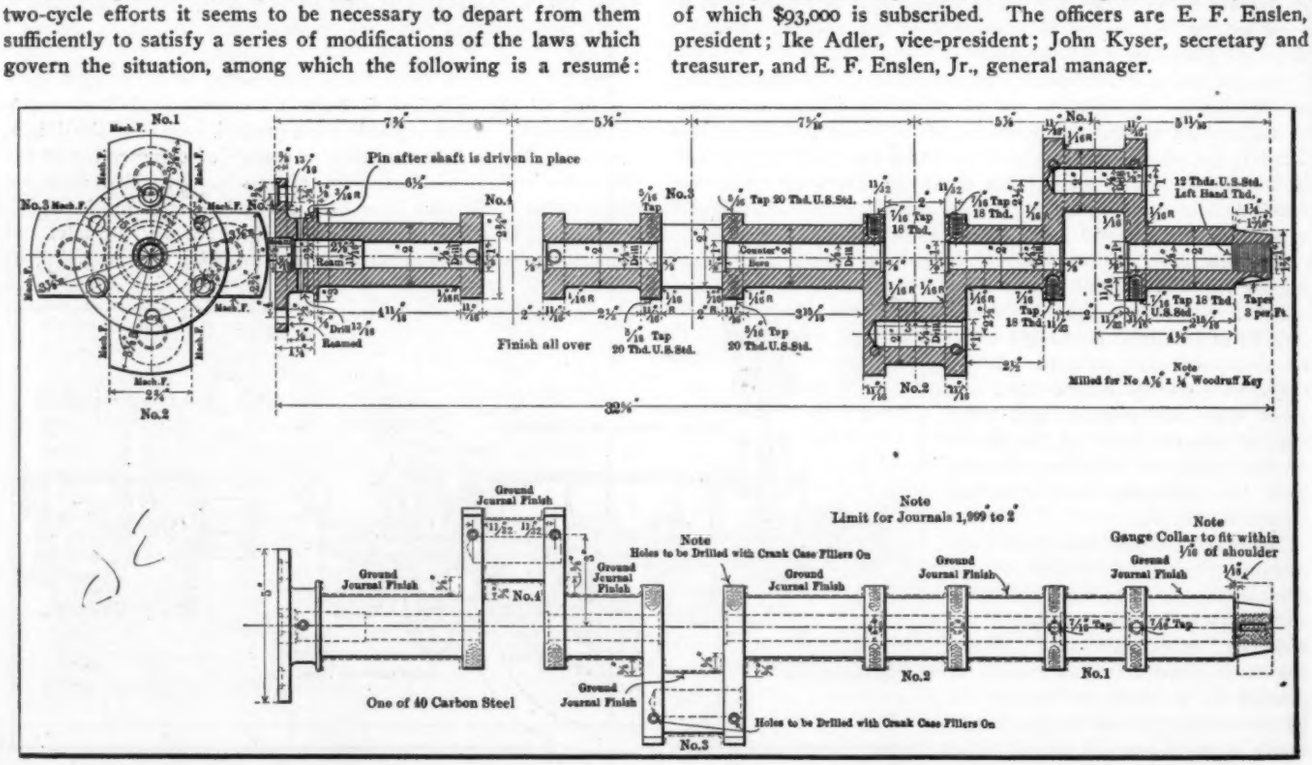


Fig. 10—Section of crankshaft, showing arrangement of cranks, amount of metal eliminated by drilling and all dimensions

ROAD SIGNS in Europe

By Francis Milfoun

PARIS, Nov. 12—The Touring Club de France, ever in the fore with innovations for the benefit of "le tourisme" in general and touring in France in particular, has already put out a number of the new "Signals for Road Obstacles" adopted by the recent "Conference Internationale de la Route" held in Paris.

Certainly the good work done by the Touring Club de France in the past shows no falling off in the legibility and accessibility of these really readable danger signals which are already being put into place at the right of the road, mounted on posts ten feet in height, and placed 250 meters before the obstacles. The automobilist who runs may read, and not be obliged to slow down and even shin up a pole to read the rather dim and altogether inefficient cast-iron governmental signboards in France.

These governmental sign-boards have in many cases already been supplemented by still more legible ones erected by the care and at the expense of the Touring Club de France on most of the international highways leading from Paris to the frontiers. They give primarily the termini of the route, as Paris—Geneve, and the distance from either end; then, in the largest letters of all, the name of the town near which it is placed, and, finally, the nearest large town in either direction. Of all useful and readable signboards to be found in any land these recently erected by the omnific T. C. F. are certainly the best planned and the most useful.

There is another class of sign-boards frequently met with in France that visiting automobiles often ignore and those are the "Octroi" signs at the entrance to all cities, and most towns and villages. In most cases a stop is compulsory, and to refuse to do so, when hailed by the official, is a misdemeanor, for which one pays in hard cash. It is an annoyance, to be sure, and many times ridiculous, but it is the law. Usually one declares that he has nothing on which to pay, though if you are a resident of the town, and are bringing home a dozen eggs from some friend's country place, a chicken, a rabbit, or even a bottle of wine, you give up a franc or more so that the dealers in that particular town who might have sold you the same merchandise are not put to a disadvantage. The French government is paternal in all things, but the very minute care which it bestows upon certain classes of its citizens make other classes mad nevertheless, and justly.

When one is held up at the gates of Paris and made to pay a tax on the gasoline and oil which he has in the reservoirs of his automobile a protest is justifiable. But you pay just the same, even if you are only a stranger going through.

Another road sign in France that one had best observe is that which holds the speed of automobiles down to a paltry twelve, ten, or even eight kilometers an hour through some crowded bailiwick. If you are a stranger, without a French residence, you may be held up on the spot for a "Contravention" and made to pay up. The fine will perhaps be comparatively small, but you will be kept in limbo, or your automobile will, which is the same thing, while the wheel of the law turns slowly on its axis and twenty-four or forty-eight hours spent in some dull little French town—seven of you, perhaps, in your big touring car—will make the cost come high, to say nothing of the fact that you will have to smoke the ordinary "Caporal," which is about the only tobacco purveyed in the small town, and drink warm, sticky, varnishy drinks on the café terrace half eaten up with flies while you are waiting.

There is another class of welcome signs which one sees distributed all over France, those of the Touring Club and the Automobile Club denoting hotels affiliated therewith, and again there are the signs of the big tire companies, which at the risk of being accused of giving a free advertisement, a couple of examples are given here, and very welcome the sight of one or the other of them may be on occasion. You all know that!

"Route Barré" is another sign not so welcome, but as it usually comes about half a mile before you find a new-made road, with its rough stones unrolled, you have time to prepare for the worst and are not on top of it without warning, as frequently happens in England. In general the road-makers in France work most intelligently and are not supposed to cover all the roadway at one time but leave a part of the road open for traffic. This is due to the energetic campaign which has been carried on by the Touring Club de France, and the Ponts et Chaussés, who has the road-making in charge, has sent strict orders abroad that the rule is to leave a part of the road open while another portion is being remade. Is there another country in the world where so

TWO SUBURBAN PARIS KILOMETRE STONES

much is being done, in the actual making and caring of roads, to make the automobilist happy? The writer thinks not.

Just now there is a new project on foot to make a new mountain highway to run from Lake Geneva to the Mediterranean, and as sponsor we learn that the Touring Club de France is back of it. There's a public-spirited body for you! Why is there not a similar institution in America, national in spirit, patriotic in a general, not a local, sense, and wealthy enough to endow any project for the benefit of touring with the funds necessary to set the ball a-rolling. After that it's easy; then local bodies come in and give their aid; some great resort en route may contribute a good round sum for the benefits that will accrue, the local automobile clubs can co-operate, and mayhap some Roi de Petrole or Prince d'Acier may endow the project as they have universities and institutions. The thing is worth looking into by all Americans who believe the new locomotion has come to stay—and who does not, save the aeroplanists?

FRENCH GOVERNMENT TOURING OFFICE

PARIS, Nov. 3—France realizes that touring, by automobile or otherwise, is worth encouraging as a business proposition. Possessing good roads, natural beauty and historical sites in abundance, it is worth while to make them known and to encourage visitors both from home and abroad. With this object in view, Minister of Public Works Millerand has announced his intention of forming a government touring office, of which he will be the president, with a board of directors composed of the leaders of automobile and touring associations, representatives of hotel proprietors, railroad companies and financiers.

The object of the touring office, which will have government funds and yet be self-contained, will be to encourage touring by all possible means. Contrary to what might at first be expected, there will be no clashing with the work of the Touring Club of France or the touring department of the Automobile Club of France. On the contrary, it will be possible for these two bodies to extend their field of usefulness, for whereas formerly their effort was limited, owing to their inability to interfere with government departments, they have now a special branch of the government to carry through improvement schemes which they may formulate. An example of this is found in an improved system of mileposts which it was desired to adopt in France. The touring department of the Automobile Club of France worked the scheme out, it met with the approvement of all, including the government, but could not be put into use owing to the inertia of the particular government department involved. There are many other schemes that have been devised by the Touring Club of France for the benefit of all tourists and road travelers which will be carried to completion now that there is a government department to help.

NEW TAXICAB REGULATIONS IN PARIS

PARIS, Nov. 3—Heavy fines and imprisonment no longer threaten Paris taxicab drivers who run with a smoky exhaust, or allow their rear light to be blown out. Drivers in the French metropolis have long been unfettered by a speed limit, the police recognizing that all the public needed was protection from the reckless driver, and not a stereotyped rate of speed, regardless of conditions.

Automobilists, and especially taxicab drivers, have been specially troubled, however, by the regulation making it an offense to emit smoke from the exhaust pipe and to run without a rear light. The first offense meant a fine, the second ditto, and the third a day in jail. For some time taxicab drivers have been kicking, and have kicked so effectively that special instructions have now been given to the police. The sergent de ville can stop any vehicle emitting smoke and, if without passengers, request the driver to draw off the excess oil causing a dirty exhaust. If there are passengers the driver can remedy the smoke nuisance on obtaining their permission to stop for this purpose. If the oil can be drawn off immediately and the smoking stopped, no summons will be issued. If the driver refuses to stop his engine smoking, or if the passengers refuse to allow him to stop for this purpose, a fine will almost certainly follow.

Instead of just jotting down the number of a car without a rear light, the Parisian policeman will first of all request that it be lighted. If the driver refuses to do this, police court proceedings will be the outcome. It is no longer allowed to take a car number and issue a summons for any offense without at the same time calling upon the driver to stop. If the driver refuses to hear the police whistle, his employer will be communicated with and the man called upon to give an explanation before proceedings are taken. This will make it impossible for summonses to be issued on wrong numbers, as so frequently happens.

Despite the changes, Paris taxicab drivers are not altogether satisfied. They maintain that imprisonment should be abolished entirely for the mere breaking of road regulations not coming under the criminal code. Unless this is done within a very brief period, they threaten to get up a huge demonstration. They have already given proof of their ability in this direction by serenading Judge Hamelin, who has passed most of the sentences of imprisonment, with the noise of several hundred hooters and the boom of the open exhaust. The outburst led to wholesale arrests, but as none were maintained it is evident that a higher authority than Judge Hamelin had interfered.

When horseflesh was in its glory, a certain number of individuals earned a livelihood by watching the cab horses while their drivers were in the shelter or eating a meal in a nearby restaurant. Since the introduction of the taxicab the horse tender has had to learn a new business. At every stand in the city is now stationed an ex-horse tender, whose business it is to close up the line as cabs move away, to trim lamps and generally make himself useful. If the ground is level or on a downgrade, the tender merely releases the brake and pushes the vehicle along until the line is closed up. If it is on a slope, however, he starts the engine and slips in the low gear without taking out clutch, runs alongside, stops, and puts into neutral again.

DARRACQ MAKES A LOW-PRICED FOUR

PARIS, Nov. 3—The old firm of Darracq & Cie. has brought out its long-expected four-cylinder 14-16-horsepower car, selling at $1,100. One of the most interesting features of the car is its frame, which is stamped from a single sheet of steel, passing under the motor and gear-box. The side channels are of inverted-U section, with flanges along the lower outer edge on which the body rests. The motor has its four cylinders, 3.35 by 3.94 inches, cast *en bloc*. The carbureter consists merely of the float chamber, into an extension of which the jet is screwed; a suction pipe comes down to the top of the jet. The extra air valve chamber and the throttle are cast with the cylinder block.

ROADS BUILDING NEWS FROM ALL OVER THE COUNTRY

WISCONSIN LAW COMPELS TOWNS TO POST SIGNS

MILWAUKEE, WIS., Nov. 13—The new law requiring town boards in Wisconsin to erect and maintain signs at important crossroads, is being complied with more fully now that the penalty clause has gone into effect. The towns were given until November 1 to erect the signs, but few did so within the limit. No persecutions have been brought, as the town boards pleaded that the farmers have been so busy with crops that they could not get to work on the signs sooner.

James T. Drought, secretary of the Wisconsin State A. A., has dropped his suit for damages against the township of Black Wolf, Winnebago county, under the statute making it a misdemeanor to place bumps and obstructions on the public highway. The town board has removed the obstructions that caused the trouble and promises to be good in the future. Mr. Drought brought the suit simply to test the law and make the boards responsible for the obstructions realize their positions.

The city of Milwaukee has purchased 100,000 gallons of asphaltum oil to be used in sprinkling the streets next summer. All new and resurfaced macadam pavements will be treated first. Twice this amount, however, will be necessary to treat all the streets, and it is expected that a repeat order will be given soon. As one application of the oil, costing the property owners $1 for every 30 feet street front, is expected to last the entire season, the oil will be cheaper than water sprinkling, which costs from 80 cents to $1.50 a season for the same area.

LANCASTER COUNTY, PA., STOPS ROAD IMPROVEMENT

WITMER, PA., Nov. 13—The road supervisors of East Lampeter Township, Lancaster County, Pa., believe that the chief duty of their office is to prevent the roads from being improved, even by an individual at his own expense. So firm are they in this belief that in the December session of court they will apply for an injunction restraining Dr. Donald McCaskey, of Witmer, from improving the roads in the vicinity.

The trouble began last May. Dr. McCaskey, after failing to get the supervisors to fix a dangerous half-mile of yellow clay road, known as the Witmer road, began in despair to make improvements himself. He made a King split-log drag, hired horses from the farmers, and got busy. After fifteen hours of labor, distributed after rains during two months, the neglected part was transformed into a substantial roadway.

The road supervisors began to be censured for their laziness when the neighborhood saw the result of Dr. McCaskey's work, and apparently out of petty spite, obtained an injunction against him. Since then they have been compelled by public opinion to use the split-log drag on fifty miles of dirt roads.

AUTOISTS BOOM GOOD ROADS ADVOCATE FOR GOVERNOR

ALLENTOWN, PA., Nov. 15—At the annual election and banquet of the Lehigh Valley Motor Club held recently, the boom for State Senator W. C. Sproul for next Governor was given a decided boost by J. H. Weeks, president of the Automobile Club of Delaware County, Pa., who incidentally criticised Governor Stuart for his veto of the Philadelphia-Pittsburg highway bill, and assured his hearers that Mr. Sproul, if elected, would accord proper treatment to all good roads legislation.

The following officers were elected to serve during the coming twelvemonth: President, Charles Mosser; vice-president, H. J. Lerch; treasurer, F. H. Sterner; secretary, R. L. Stuart; board of governors, M. H. Strauss, William Erdell and W. D. Schantz.

HOW AUTOISTS HELP KEEP ROADS IN REPAIR

PHILADELPHIA, Nov. 15—Frank Hardart, Sr., is an automobilist 24 hours a day, every day, even though he has large business interests of Philadelphia and other cities. He is also a member of the common council of the Quaker City, but even so he finds time to enter every endurance, reliability, and sociability run held within a hundred miles of his home. He is a prominent official and hard worker in the Quaker City Motor Club, and when he moves to his summer home at Glen Loch he transfers his activities there and wakes up the natives. Recently the East Whiteland Township committee met at his home on the Lancaster pike, when it was shown that $3,400 had been spent during the past year in resurfacing the four miles of that famous old highway that bisects the township. Then the committee censured the authorities of the Borough of Malvern for failure to keep pace with them in keeping "the pike" in good shape in their particular bailiwick, and urged the Malvernites to wake up and realize what they are losing by failing to maintain their roads in good condition. Automobilists of Hardart's caliber are a credit to the cult.

DELAWARE CAPITAL CELEBRATES NEW PAVEMENTS

WILMINGTON, DEL., Nov. 13—Having spent $75,000 in the improvement of streets this year, and having laid the first new pavement in the town, Dover, the capital of the State, is planning a celebration of the event for Thanksgiving, and it is proposed to have as one of the features an automobile parade over the paved streets. Many of the Wilmington autoists will take part.

An arrangement has been made whereby the Delaware Automobile Association is to provide signs to be placed by the Grangers at dangerous road intersections in Brandywine Hundred, and by the city park commissioners on the park drives.

OHIO WITHOUT PROVISION FOR ROAD MAINTENANCE

COLUMBUS, O., Nov. 13—By the decision of the Ohio Supreme Court recently handed down, improved highways in the Buckeye State are left without any provision for their care and maintenance. Conflicting special laws which provided for the care of pikes for a score of years were swept away. The case came up from Gallia County, and simply carries out the opinion of Attorney General Denman, given some time ago. The General Assembly will be called on to enact a law to fill the void.

MARYLAND STATE COMMISSION AND CLUB CONFER

BALTIMORE, Nov. 13—It has been at last arranged for the Maryland Automobile Commission, headed by Governor Crothers, and the Automobile Club of Maryland to get together within the next week and come to some agreement on the automobile bill which the commission wishes to present to the next Assembly. The tax feature is the chief bone of contention, and it is probable that the present law will be changed in this section, as the result of the meeting.

NATIONAL ASSOCIATION MEETS IN SUNFLOWER STATE

TOPEKA, KAN., Nov. 13—The National Good Roads Association will hold its tenth annual session on December 14 and 15 at Topeka. Arrangements for the entertainment of delegates will be made by the Kansas Good Roads Association. The motto proposed for the association is "Work for National and State aid."

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RACING ON SPECIAL TRACKS

Automobile racing, as an amusement proposition, has often proved its profitableness. As a popular attraction it ranks with horse racing, bathing beaches, and the Streets of Cairo. In certain events of the past summer it showed ability to take that place in the esteem of the masses which in Roman days was filled by the gladiatorial contests. Naturally its value to the industry fell in proportion to its popularity. The maker learns nothing of the weak points of his car if the car is smashed and the driver killed. The sales manager, too, is likely to find such exhibitions the reverse of good advertising.

Racing on special tracks is devoid of many of the popular—so-called—features, and likewise regains to a considerable degree the engineering value of the races in the early days of the industry. Now the term "special track" appears to require definition. Many people believe that if a defunct horse-track is caught before being cut up into building lots, and is treated with liberal applications of advertising, it becomes *ipso facto* a "motordrome." This idea must be severely discouraged. A special track is a track built specially for automobiles, with due regard to their weight, speed, and destructive effect on the surface.

England has a shining example in the Brooklands track. This big concrete oval is the most valuable asset of the British automobile industry. It provides an amusement which, if it has not so strong a hold on the gladiatorial element, appeals all the more to prospective buyers. At the same time it affords an opportunity for really scientific tests of cars at speed. As an example may be mentioned the experiments on air resistance conducted by the indefatigable S. F. Edge.

The Atlanta track comes the nearest to the value of a Brooklands of anything on this side of the Atlantic. The big racer which Nazzaro drove at 120 miles an hour on Brooklands made but 95 miles an hour on the Atlanta course; and without discussing the merits of Nazzaro and Strang as drivers, it appears that Brooklands has considerably the better of it.

This of course is largely due to the perfect banking of the English course. The degree of banking is figured out by a very simple formula, depending on the speed and the radius of the curve. For a speed of 120 miles an hour, on a thousand-foot radius, the banking should be at an angle of about 44 degrees from horizontal. Brooklands, by providing the right degree of banking, makes the speed reasonably safe for any experienced driver. No other track in the world does so. Moreover, their failure to provide the banking makes it impossible to attain such speeds on them.

On special tracks automobile racing becomes once more a safe and useful sport, beneficial to the industry and still not without profit to the promoters. Atlanta's track has shown great speed, with reasonable safety insured its users; that of Indianapolis, newly surfaced, will live down its disastrous opening; but the highest reward, both financial and otherwise, awaits the man who will give this country a Brooklands.

"FOR MEN OF MODERATE MEANS"

More and more the automobile manufacturers are heeding the demands of that indefinite but powerful class known as "the men of moderate means." By good fortune it happens that what these men want is exactly what is best for the manufacturers, even though some of these latter have not yet recognized the fact. Simplicity and economy are the qualities most desirable in every machine, and the automobile is no exception.

The demands of this class have added to the designer's repertory the block cylinder casting, thermo-syphon cooling, magneto ignition with fixed spark timing, the circulating system of lubrication and the pressed-steel live axle. They have called the designer from the making of road locomotives, and have showed him that greater possibilities and problems even more worthy of the solving lay in the light four, and even in the humble "one-lunger." Any man of moderate skill and some experience can design a fairly satisfactory 40-horsepower car; but the small car calls for original and inventive talent.

To the man of moderate means we must look for much future progress in design. We can already build cars of a speed which must be close to the limits of human endurance; and the reliability of the present automobile compares favorably with that of any other piece of machinery. Were it a question of speed alone, we might well rest on our laurels; but first cost can always be reduced, and running expense and maintenance lightened. These are the directions which future improvement must take; and the industry owes a debt to the men of moderate means for awakening it to this fact.

FRENCH MAKERS NOT ENTHUSIASTIC FOR THE GRAND PRIX

PARIS, Nov. 10—A big query must be placed after the Grand Prix of the Automobile Club of France for the year 1910. The club has announced the race, the conditions are absolute liberty regarding dimensions, horsepower and weight; the distance 500 miles, and the probable date the first week in July. There is a proviso, however, in the nature of the rule that 45 entries must be received by November 30 or no race will be held.

While a fortnight ago it looked as if the 45 could easily be obtained, for the racing board having voted the speed test is comprised of the leaders of all the leading factories, it now appears that the business managers and board of directors do not share the sporting enthusiasm of the Commission Sportive. Thus we have the sight of René de Knyff, chairman of the racing board, being in favor of a speed test, while the Panhard company, of which he is an important unit, shrugs its paternal shoulders in indifference. Louis Renault, as a member of the racing board, votes for a sporting event, but his factory at Billancourt will not produce a speed monster. Brasier rubs his hands and looks wise when a no-limit rule is proposed, but his board of directors shout an emphatic "No." Altogether there are eight French firms, comprising Panhard, Darracq, Charron, Renault, Unic, Peugeot, Motobloc and Dietrich, having come to a common agreement not to race. The foreigners who will abstain are Mercedes and Minerva. Their reasons for refusing to take part in the A. C. F. sporting event are that this year there was no race and business did not suffer, and there is no reason why they should go to the expense of a speed test next season.

The club has made a close enquiry among constructors with the result that it has obtained a promise of 34 cars. No money has been paid, however, and there is always a possibility that some of these will not produce the necessary cash. The willing ones are De Dion-Bouton, one of the few big firms having never previously taken part in a speed test; Mors, Rolland-Pilain, Sizaire-Naudin, Gregoire, Delage and Guillemin; Italy will have Fiat; Germany Benz and probably Opel; Spain Hispano-Suiza; England an Austin team; and either America or England a Mitchell team—for it does not appear to be clear to the club which Mitchell company has made a promise.

The odds are that the race will not be held, but as it only needs 11 more cars to complete the list it is not safe to prophesy. In any case, the race will not have the importance of previous events, for only two leading French firms are entered, the others being voiturette specialists not having made a previous attempt at a big racer.

FURNITURE CITY PLANS ROAD RACE IN 1910

GRAND RAPIDS, MICH., Nov. 13—The automobile club of this city decided at a special meeting to promote an automobile road race next summer, and a committee has been appointed to work out the details. The course chosen is south of the city, about 14 miles in length, and rectangular. It is planned to expend $16,000 in improving this stretch of sandy road and in meeting other expenses.

The committee consists of Albert Stickney, chairman; M. R. Bissell, roads and guards; Benjamin S. Hanchett, funds and privileges; Fred Z. Pantlind, grandstand and parking; W. S. Farrant, officials; A. H. Vandenburg, publicity, and F. C. Warnshuis, entries and prizes. Mr. Stickley, the chairman, into whose hands will fall the general supervision of the event, is one of the leading manufacturers of the city. Mr. Hanchett is general manager of the street railway system. The other members are all prominent in the club's affairs.

ALREADY PLANNING NEXT FAIRMOUNT RACE

PHILADELPHIA, Nov. 15—The Quaker City Motor Club is already at work on the details of the third annual Fairmount Park stock chassis race. It has been practically decided to double the prize money, making the winner's end an even $5,000, with $2,500 for the second car, $1,500 to the third, and $1,000 to the fourth. The success of the race last month was such that no trouble will be experienced in getting the consent of the Fairmount Park Commission to grant again the use of the roads.

The immediate attention of the contest committee, however, is directed to the annual New Year's endurance run, December 29 and 30, which will probably have some Southern city for its objective. Although some of the members are a trifle sore over the rather cavalier treatment the club received from the A. A. A., and some fear that the usual number of entries will not be forthcoming, the pathfinders will start out early next month. Entry blanks will be issued as soon as the route is definitely decided on.

ANNUAL MEETING OF THE A. A. A., NOVEMBER 30

ANNUAL meeting of the board of directors of the American Automobile Association has been called for November 30 at the Hotel Belmont, New York City. At that time the annual reports of the officers and chairman of the various boards will be made, and from the nature of the work accomplished during the past year, these reports are expected to cover a wider field toward illustrating the automobile progress of the country than ever before. The first meeting of the new board of directors for the election of officers for the coming year will be held on the following day, December 1.

Strong Western Clubs Join A. A. A.

The Automobile Club of St. Louis, which withdrew from the American Automobile Association about two years ago, has returned to membership in the national organization. The Detroit Motor Club, another of the large and energetic clubs in the West, has applied for membership. Still a third evidence of growth and willingness to co-operate with the association in its efforts for good roads, good laws and favorable touring conditions in all parts of the country, comes from the Pacific Coast, where the latest reports from the California State Association show that the membership has jumped from a few hundred a couple of months ago to over 1,500 at the present time.

Coming on the eve of the annual meeting of the A. A. A. these evidences of increasing growth and membership are particularly encouraging as attesting to the readiness of automobile owners in all parts of the country to work together for the best interests of motoring.

The Automobile Club of St. Louis has a membership of nearly 450. At the recent meeting of its board of directors, when the action to renew its affiliation with the A. A. A. was unanimously adopted, President Samuel D. Capen spoke of the benefits likely to accrue to Missouri in the movement for good roads in view of the fact that the third annual A. A. A. Good Roads Convention will be held at St. Louis next year. President Capen has conferred with President W. W. Cowen, of the Kansas City Automobile Club, toward organizing a strong State association in Missouri. The latter club has nearly 350 members, and other clubs eligible to join are those of Springfield, Joplin and St. Joseph.

NEW AUDITORIUM FOR MILWAUKEE SHOW

MILWAUKEE, WIS., Nov. 13—The Milwaukee Automobile Club has definitely decided to hold the second annual Milwaukee show on February 22 to 27, inclusive, in the new $500,000 Auditorium. The only objection to this date was that it is the same as that of the Kansas City, Mo., show, but it is not thought that the two will conflict seriously. Both were held on the same date last March.

Clarke S. Drake, president of the M. A. C., has been chosen to manage the show. He has already received applications for space. Drawing for reservations will take place January 26. This year, with the advantage of the new location, a definite plan of arrangement can be carried out, giving a separate department for the exhibits of pleasure and commercial cars, motorcycles and accessories. The Auditorium is located at State, Cedar, Fifth and Sixth streets, near what is called Milwaukee's auto-automobile row. In addition to its central location, the Auditorium has the further advantage of being surrounded by wide streets paved with asphalt.

FLAG-TO-FLAG CONTEST POSTPONED

DENVER, Nov. 15—The flag-to-flag endurance and reliability contest for automobiles from Denver to the City of Mexico will be held next Summer instead of this month, as originally planned. The official announcement of the change was made today. It is planned to hold the contest in June or July, during the centennial celebration at the Mexican capital.

NEW YORK UP-STATERS PLAN MARCH SHOW

SYRACUSE, N. Y., Nov. 13—The Automobile Dealers' Association held a meeting at the Yates Hotel last night to discuss the date of the 1910 show. The association would like to have it directly after the Boston show, which opens March 12, but the exact date has not yet been decided. In order to provide ample room for the exhibits that are expected, it is planned to secure the New York State cavalry armory, in addition to that of Company C, which was used last winter. An effort will be made to secure permission to cut a door between the two armories, which adjoin each other, so that visitors will not be obliged to go outdoors to get from one to the other. The members of the various show committees will be named at a future meeting.

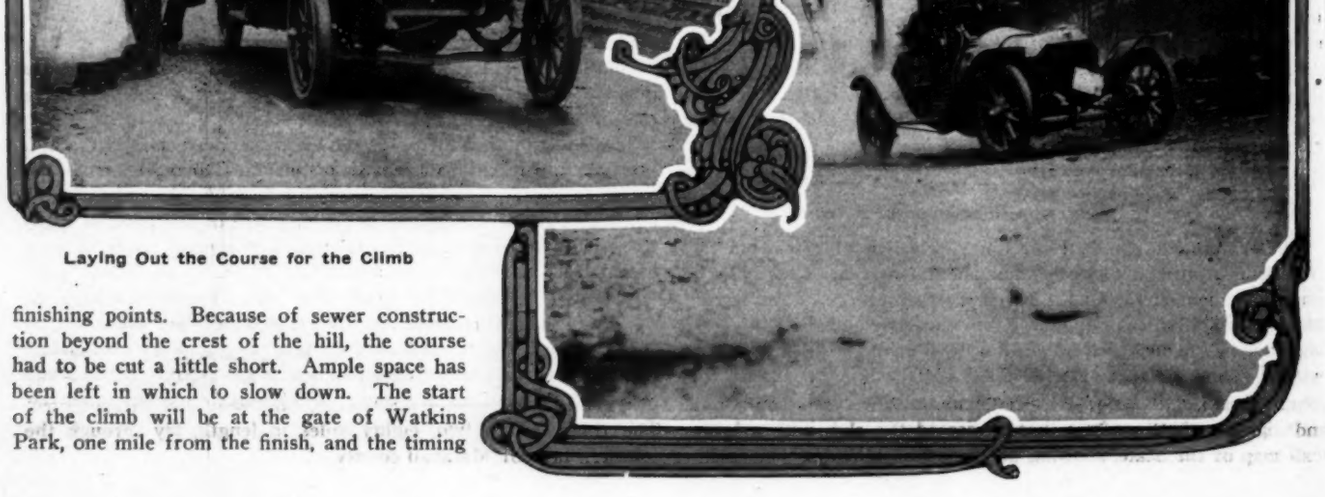
COLUMBUS SHOW SPACE ALL ALLOTTED

COLUMBUS, O., Nov. 13—All the space set apart for automobile exhibits in the show to be held under the auspices of the Columbus Automobile Club December 25 to January 1 has been sold. A number of automobile accessories will also be exhibited, and applications for space from accessory makers are numerous. Perin B. Monypeny, Northern Hotel Building, is chairman of the committee in charge of space allotments. It is planned to make one night a society occasion; a special entertainment will be given at the price of a double admission. Sterling Welsh, of Cleveland, is in charge of the decorations, which will be appropriate to the holiday season. About fifty makes of cars will be exhibited.

EXCELLENT COURSE LAID OUT FOR FORT LEE CLIMB

NEW YORK, Nov. 15—A number of New York autoists went over to Fort Lee last Sunday to test the course on which the Edgewater-Fort Lee hill climb is to be held on Thanksgiving Day. The road has been greatly improved, and was found in excellent condition. The Edgewater-Fort Lee Automobile Association, which was formally organized last week, had a committee go over the course with a surveyor to determine the starting and finishing points. Because of sewer construction beyond the crest of the hill, the course had to be cut a little short. Ample space has been left in which to slow down. The start of the climb will be at the gate of Watkins Park, one mile from the finish, and the timing instruments and officials will be located on a bluff overlooking the road. All starts will be standing, as the starting point is on a slight down grade.

The illustrations depict the course being tried out by local trade representatives. The picture on the left is the Velie being driven by E. R. Strobel, of the Garland Auto Company, and the right-hand view shows a Lancia, with Harry Fosdick, of the Hol-Tan Company, at the wheel. The course is easily accessible via the Fort Lee ferry from the foot of Manhattan street (West 130th). New York dealers are well pleased with the course and the attendance possibilities, and their support has assured a representative entry list.



Laying Out the Course for the Climb

What the Clubs Are Doing These Days

GREEN MOUNTAIN CLUB CONFERS ON STATE LAWS

MONTPELIER, VT., Nov. 15—The annual meeting and election of the Automobile Club of Vermont resulted in the choice of the following officers: W. W. Brown, president; James M. Boutwell, first vice-president; Dr. J. Holmes Jackson, second vice-president; S. S. Ballard, secretary and treasurer, and G. H. Morrill, director. The date of the annual meeting was changed from the third Thursday in October to the first Saturday in September.

A vote of thanks was tendered C. W. Gates, the State highway commissioner, for the efficient manner in which he has conducted improvements during the past year. During this time the State received $27,000 in automobile license fees, which is to be expended on the roads. The club voted to continue its campaign for the erection of signs marking both danger points and crossroads. It is expected that the towns will co-operate in the placing of the latter.

Guy W. Bailey, Secretary of State, who became a member at this meeting, addressed the club on the working of the new State law, and expressed the willingness of his department to recommend such modifications as the club might find desirable. James M. Boutwell, J. W. Gordon and J. G. Brown were appointed a committee to confer with Mr. Bailey on this subject. It is the prevailing opinion of the members that the present license fee of $1 for each horsepower is too high. Mr. Bailey said nothing about this tax, but suggested other improvements.

MILWAUKEE CLUB'S SPORT AND BUSINESS

MILWAUKEE, WIS., Nov. 12—The Milwaukee Automobile Club will hold an informal club run on Saturday, November 13, from Milwaukee to Madison, about 80 miles, to see the Wisconsin-Minnesota football game for the Western conference championship. James T. Drought, of the touring board, is an alumnus of Wisconsin, and the club numbers among its members many graduates of both institutions. Parking space has been provided for members.

An imposing committee on legislation has been appointed, consisting of Alonzo Burt, State Senator Julius E. Roehr, Emil O. Hoffman and George A. West, with James T. Drought as chairman. Other committees are those of racing, good roads and runs and tours, presided over by Dr. J. F. Schreiber, Faustin Prinz and M. C. Moore, respectively.

SIGN-BOARDING PLANS IN THE FLOUR CITY

MINNEAPOLIS, MINN., Nov. 13—The Minnesota State Automobile Association is getting a nice profit out of the issue of its annual tour book for the Northwest, and the club officers are working on a plan to divide this profit among the 32 clubs of the association for application to sign-boarding work. Outside of Hennepin County, which boasts of some 200 signs, the State is largely destitute of guides to the tourist. Under these conditions it is likely that the plans to state a general movement in this direction will meet with great favor.

HARTFORD CLUB HAS DISTANCE CHART OF TOWNS

HARTFORD, CONN., Nov. 15—William T. Plimpton, assistant secretary of the local club, is working on a chart which, when completed, will show the exact distance between every city in the State of Connecticut. There are something like 275 towns included. The chart should prove of considerable assistance to visiting tourists. Charles D. Rice, chairman of the good roads and sign-boards committee, has presented the club with a large wall map of the State, showing all the main highways.

HARTFORD STILL BOTHERED BY THE TURNPIKE

HARTFORD, CONN., Nov. 13—At the last meeting of the club C. H. Gillette was re-elected a director in the American Automobile Association. F. W. Stickle, Walter S. Schultz, R. D. Britton and S. C. Doty were appointed a grievance committee, and all complaints will in the future be referred to them. The report of the treasurer showed that the organization is in good financial condition. According to figures recently issued by the A. A. A., the Automobile Club of Hartford is eleventh on the list of affiliated organizations in membership. The club has made a considerable gain since the opening of the new quarters. The present membership is 352, and several applications are on file.

Complaints are still being made of excessive speeding on the new Berlin turnpike. The State highway commissioner has threatened to have the stretch patrolled if this is not stopped.

PHILADELPHIANS NEAR THE 1,000 MEMBERSHIP MARK

PHILADELPHIA, Nov. 16—Twenty-eight new members admitted at last week's meeting have brought the membership total of the Automobile Club of Philadelphia up to 980, and a determined effort is being made to reach the thousand mark before the December meeting. When that "dead line" is attained the limit allowed by the by-laws will have been reached, and a waiting list be in order.

A recent and highly commendable convenience inaugurated by the club management is the keeping of an up-to-date "chauffeurs' list," on which will be recorded the names of all qualified experts who desire to file their names with the club and are willing to have their records verified. Quite a number of local wheel handlers have already put their names on the list, and the innovation promises to pan out successfully.

NORTH WILDWOOD'S CLUB GETS BACK TO TOWN

PHILADELPHIA, Nov. 16—The North Wildwood Automobile Club, which in the good old wintertime transfers its operations to the Quaker City, will open its social season next Monday night with a "gasoline night" in the Bohemia Hall of the Pen and Pencil Club, at 1026 Walnut Street. Despite the fact that no sanction for the affair has been granted by the A. A. A., the preliminary announcement predicts that in view of the fact that the speed limit has been done away with, many records will be broken. The club is composed largely of Philadelphia automobile tradesmen and news writers.

QUAKER CITY CLUB WILL BANQUET, JANUARY 6

PHILADELPHIA, Nov. 16—The members of the Quaker City Motor Club are evidently in earnest to acquire a clubhouse of their own. Amendments to the by-laws have been introduced providing for an increase in dues, and options have been secured on several sites in the immediate vicinity of Broad and Walnut streets. The committee on annual banquet has selected the evening of Thursday, January 6, for that symposium, when it is expected that prominent local and State officials and well-known national automobile celebrities will be present.

SUNFLOWER STATERS ENJOY SOCIABILITY RUN

MARYSVILLE, KAN., Nov. 13—Despite threatening weather, forty-two of the fifty entries made their appearance for the "sociability run" of the local club, and were not disappointed. The route of the trip, eighty miles in length, lay through the southern half of Marshall county.

MAXWELL-BRISCOE INCREASES PRICES

The Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., has increased the prices of its two small cars, the 12-horsepower and the 22-horsepower; instead of selling at $550 and $850, as heretofore, the prices will now be $600 and $900, respectively. The price of the 30-horsepower model remains the same, $1,500.

The reason for this advance, as stated by the Maxwell company, is the constant increase in the price of raw material. Crude rubber has advanced to such a degree that a set of tires costs to-day from $30 to $60 more than a few years ago. The manufacturer feels this advance even more keenly than the user, because all special prices to manufacturers on quantity orders have been withdrawn or greatly curtailed.

In connection with the advance, the Maxwell company says that among large automobile manufacturers the profit per machine is probably lower than that obtained in making any other class of machinery. For example, in the stationary engine business a 10-horsepower engine selling at $450 gives the manufacturer $100 profit; whereas it is affirmed that the small Maxwell runabout, at the new price of $600, yields but $73 profit.

ANNUAL MEETING OF THE A. S. M. E.

The thirtieth annual meeting of the society will be held in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, December 7 to 10. The social entertainment will be in charge of the members resident in and about New York City, under the immediate direction of a committee of which William D. Hoxie is chairman.

For the afternoon of Wednesday, December 8, an excursion is planned which members and guests will be asked to attend in a body. During the rest of the period there will be opportunities for smaller bodies to visit places of interest. In the evening of the 8th there will be a lecture on agricultural machinery.

The professional papers assigned for the meeting are as follows: "Tests on a Venturi Meter for Boiler Feed," Chas. M. Allen; "The Pitot Tube as a Steam Meter," Geo. F. Gebhardt; "An Electric Gas Meter," C. C. Thomas; "Testing Suction-Gas Producers with a Koerting Ejector," C. M. Garland and A. P. Kratz; "Bituminous Gas Producers," J. R. Bibbins; "Lineshaft Efficiency, Mechanical and Economic," Henry Hess; "Pump Valves and Valve Areas," and a "Report on Cast-Iron Test Bars," A. F. Nagle.

BOOKS FOR THE AUTOMOBILIST

"Automobile Troubles, and How to Remedy Them," by Charles P. Root, is a book for the new driver, repair shark and owners desiring to know what to do in emergencies other than hiring a horse to pull the car home. It is of pocket size, bound in flexible leather covers and consists of two parts. The first, 166 pages in extent, is devoted to troubles and their remedies, starting with a tabular compilation of the more common troubles, which should be very handy. Following that, the rest of the 220 pages is devoted to overhauling the car, such as would be done on putting it away for the winter and general repairs. Not all of the matter is new, but all of it is good. The illustrations are good and illustrate clearly the desired points, but the small number of them used leaves much to be desired in this line. The beginning of the book has the trouble heads arranged alphabetically, but, unfortunately, this arrangement is not carried out through the whole work. It is published by the Charles C. Thompson Company, Chicago.

"The Conquest of the Air"—A. Lawrence Rotch, professor of meteorology at Harvard University, and director of the Blue Hill Meteorological Observatory, writes of aerial navigation from a new point of view. He looks on the air as an ocean of vapor, and similar to the aqueous ocean in its disturbance by tides and currents. The study of these tides and currents has been Professor Rotch's life work, and his knowledge of them has found universal recognition. Such knowledge is invaluable in the direction of free balloons, and of no mean importance to the operators of dirigibles and aeroplanes. The currents of the air move so rapidly in proportion to the speed of the craft which must contend with them that the location of a favorable current is always of great advantage. Until the science of aerodynamics has made far greater progress than the most enthusiastic has yet dared to predict, Professor Rotch's first chapter on "The Ocean of Air" must remain an invaluable guide to aeronauts.

The four remaining chapters of the work, which is modest in size, treat respectively of "The History of Aerostation," "The Dirigible Balloon," "The Flying Machine" and "The Future of Aerial Navigation." They are of particular value as a historical view of the work in this field; no attempt is made to enter into the technical side of aerodynamics. The volume is published by Moffat, Yard & Company, as one of its series of "Present-Day Primers."

THE AUTOMOBILE CALENDAR

AMERICAN

Shows, Meetings, Etc.

Dec. 25-Jan. 1....Columbus, O., Automobile Show, Columbus Automobile Club.

Dec. 31-Jan. 7....New York City, Grand Central Palace, Tenth International Automobile Show; American Motor Car Manufacturers' Association, with Importers' Automobile Salon and Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth Avenue, New York.

Jan. 8-15.....New York City, Madison Square Garden, Tenth National Show, Association of Licensed Automobile Manufacturers.

Jan. 17-22.....Philadelphia, Second Regiment Armory, Automobile Show. J. H. Beck, Secretary, 216 Odd Fellows Building.

Jan. 24-29.....Detroit, Wayne Hotel Gardens, Third Annual Automobile Show, Detroit Auto Dealers' Association. John Gillispie, Manager, Hotel Tuller.

Feb. 5-12.....Chicago, Coliseum, Ninth Annual Automobile Show, National Association of Automobile Manufacturers. S. A. Miles, General Manager.

Feb. 14-19.....Buffalo, N. Y., Broadway Arsenal, Eighth Annual Automobile Show, Automobile Club of Buffalo. Dal H. Lewis, Manager, 760 Main Street.

Feb. 19-26.....Newark, N. J., Essex Troop Armory, Automobile Show. New Jersey Exhibition Company.

Feb. 24-26.....Binghamton, N. Y., State Armory, Automobile Show. R. W. Whipple, Secretary.

Feb. 22-27.....Milwaukee, Wis., Auditorium, Second Annual Automobile Show, Milwaukee Automobile Club.

Feb. 22-26.....Kansas City, Mo., Convention Hall, Fourth Annual Automobile Show.

March 5-12.....Boston, Mechanics' Building, Eighth Annual Automobile Show, Boston Automobile Dealers' Association. Chester I. Campbell, General Manager, 5 Park Square.

March 19-26.....Buffalo, N. Y., Convention Hall, Third Annual Power Boat and Sportsmen's Show. D. H. Lewis, Manager.

FOREIGN

Nov. 12-20.....London, Olympia, Eighth Annual International Automobile Show, Society of Motor Manufacturers and Traders.

AMERICAN

Races, Hill Climbs, Etc.

Nov. 19-25.....Redlands, Cal., Hill Climb, Mile High Hill Climb Association.

Nov. 20-21.....New Orleans. Annual Fall Meet, New Orleans Automobile Club. Homer C. George, Secretary.

Dec. 22-39.....Philadelphia, Fourth Annual Midwinter Endurance Contest, Quaker City Motor Club.

Feb. 4-6.....New Orleans, Annual Mardi Gras Speed Carnival, New Orleans Automobile Club.

INDIANAPOLIS IS A BUSY AUTO-MAKING TOWN

INDIANAPOLIS, Nov. 10—Wheeler & Schebler, makers of the Schebler carbureter, are now melting down about two car loads of ingot copper per month, not counting other ingredients as lead, tin and spelter, in the production of carbureters, and not a few shipments are being made in carload lots (approximating 5,000) to individual companies. The plant is in full swing, and ground will soon be broken for a new addition, which will add 59,750 square feet of floor space, of which 8,000 square feet will be in the new foundry. The power plant, using gas engines and producer gas, will have a 250-horsepower engine in the new acquisition.

The Diamond Chain Company, besides the regular line of sprocket chains as used in automobile work, is handling a wide line of chains, and, contrary to the usual expectation, chain work is increasing with such rapid strides that the company is hard pressed in the matter of handling all the trade it is offered. New additions of machinery are being made as rapidly as possible, and many improvements are being added. A new garage has been built for the officers of the company, and the electrical equipment of the plant includes a complete charging equipment of the latest and best design to handle electric vehicles.

D. M. Parry, of the Parry Auto Company, is banking on the permanence of the automobile, and among other interests is making every preparation to manufacture cars on a large basis. The Parry cars, of which there are two models (roadster and touring car), are being pushed out with the idea that the serial number 5,000 will show up on the production dial before the end of the 1909-'10 period. Besides the large plant now available, the company is adding much more floor space by way of new buildings.

Nordyke & Marmon, in their well equipped plant, are making their own cylinders, aluminum castings, brass, bronze and in fine everything of moment. The new models are well in hand; cars are being put out at a rapid rate, and the quality of the work being done is up to the well-known standard of the company. The engineering office is practically through with 1910 designing, and the able "staff" is now in a position to carefully check up on every detail of the work as it comes through.

Charles Blizzard, general manager, and Bruce Ford, engineer, of the Electric Storage Battery Company, Philadelphia, reached Indianapolis, having done Chicago, a few days ago. It is the settled policy of the company to look well after the users of Exide batteries, and the management seems to understand the value of personal calls on the trade.

F. W. Spracke Machine Company, parts maker, is doing a vast amount of work for automobile makers throughout the country, and when the representative of THE AUTOMOBILE called he was entertained in a most interesting way, having had the pleasure of seeing more kinds of grinders doing accurate work than is usually found under one roof. F. W. Spracke, himself a tool designer of wide reputation, recently perfected a grinder which will grind (all over) such irregular shapes as cams for integral camshafts, thus saving much time and doing the work far more accurately than seems to be possible in any other way.

George Schebler, of Wheeler & Schebler, recently completed a twelve-cylinder motor, and having placed it in a chassis of suitable design, started on a jaunt overland. The motor, which is of the water-cooled V type, performs extremely well, and the compactness of the power plant is one of the wonders of Indianapolis.

The Indianapolis Speedway is now being brick-paved, and the entire undertaking will be completed in about three weeks. The banking is scientifically done and the tangents are as level as any road can be. The representative of the AUTOMOBILE was unable to discover a spot over the surface that falls outside of the specifications of 3-8-inch depression in twelve feet. The paving brick used are of a superior grade, and the grouting is done with the utmost care. A 15-foot sweep to the sides of the paved way is being prepared so that if a car does run wild it will have ample room to play in.

TWELVE AUTO MAKERS IN INDIANAPOLIS

INDIANAPOLIS, IND., Nov. 15—Apparently the only limit to building automobiles in this city next season will be the ability to get sufficient parts. Present estimates base next year's production of local factories at 25,000 cars.

Another new company has just been added to the list, making twelve concerns in the city now making automobiles. The new company is the Star Motor Car Company, which has an authorized capitalization of $100,000, of which $75,000 is paid in. A plant will be built at once and a line of runabouts and touring cars to sell at about $1,000 will be made, together with delivery wagons and trucks.

In addition to this, there will be three other practically new local companies in the field during the 1910 season. These are the Cole Motor Car Company, organized from the motor buggy business of the Cole Carriage Company; the Parry Automobile Company, which will build 5,000 cars, and the Empire Motor Car Company.

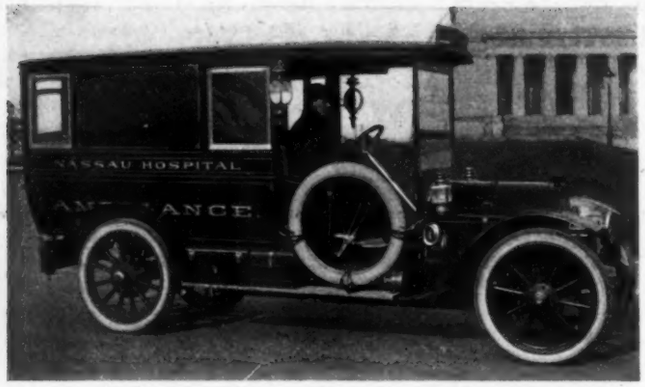
TIRETOWN NEWS TELLS OF BIG GOODYEAR CONTRACT

AKRON, O., Nov. 14—The Goodyear Tire & Rubber Company has applied to the city council for the vacation of a part of an East Akron street for the purpose, if the request is granted, of adding to its plant two factory buildings, five stories high, aggregating 500 feet in length and affording 150,000 square feet of floor space; the establishment of a reclaiming plant with a capacity of ten tons a day; and the employment of 600 to 800 additional men inside of 90 days. The closing of contracts by the company to furnish automobile tires for Buick, Cadillac, Welch, Oldsmobile, Oakland, Reliance, and Rapid, the concerns constituting the General Motors Company, has necessitated a large increase in the capacity of the plant, and the company is compelled to enlarge or go elsewhere.

Though a story has been current that the Goodyear Company was about to be absorbed by the General Motors Company, President F. A. Seiberling positively denies any such intention. It is well understood, however, that the offer to move the plant to Detroit traces back to the big contract for tires with the General Motors Company, but the Goodyear officers refuse to discuss this phase of the situation.

The Palmer-Hawkins Company of this city has equipped a motor truck with a set of its sectional tires 36" x 10", claimed to be the largest set of solid rubber tires ever manufactured or applied in the United States, if not in the world. The truck will be used in Florida, where the sandy roads render the use of ordinary tires impossible.

The Motz Clincher Tire & Rubber Company began an action in the Federal Court at Cleveland, November 13, against the Swinehart Clincher Tire & Rubber Company, alleging infringement of a patent covering its twin-tread and webbed-side tire, which it claims is also manufactured by the Swinehart Company. An injunction and damages are asked. A number of similar suits against the same company will follow, the Motz company says.



Chalmers-Detroit Ambulance for Nassau Hospital

This ambulance, which was built by Carl H. Page & Company, New York representatives of the Chalmers-Detroit Motor Company, for the Nassau Hospital, is reputed to be one of the finest specimens of its type in the metropolitan district. The body is mounted on a "Forty" chassis, and is fitted with every convenience for the patient that the medical fraternity could suggest.

FRENCH TYPE RUNABOUT FROM LONG ISLAND

Single-cylinder runabouts of the type familiarized by the French voiturette races are to be built in this country by a recently organized concern known as The Only Car Company, Inc., located at Port Jefferson, L. I. The company is capitalized at $300,000. At present work on sample cars is being pushed in temporary quarters, but a concrete building having 16,000 square feet of floor space has been planned and will be erected soon.

The single-cylinder motor is to be of the long-stroke type, resembling the Sizaire-Naudin, Lion-Peugeot and other French types. The racing cars of these companies develop 20 horsepower from a single-cylinder motor of 4 inches bore. The cars at present under construction are of the roadster type, and will be entered in races in the spring. They will sell at $700, with a guaranteed speed of 60 miles an hour. Long wheelbase, a large hood, straight-line shaft drive, imported ball bearings, and liberally designed steering knuckles and gear are some of the features mentioned.

The chief engineer of the company is François Richard, who will be remembered as the designer and builder for A. G. Vanderbilt of an eight-cylinder car which was intended to compete in one of the meets at Ormond Beach several years ago.

Plans for the future include the production, in addition to the roadster type, of a five-passenger model, together with taxicabs and light delivery wagons. The simplicity and economy of the modern single-cylinder engine should open a wide field for cars of this type, and although popular prejudice must be overcome, they should find extensive use.

1910 JACKSON "MUD HEN" ON ITS 1909 RUN

Starting November 16 from Jackson, Mich., with a letter from the mayor of that city to the mayor of Bangor, Me., E. P. Blake, of Boston, and Charles G. Percival, of New York, accompanied by a mechanic, will attempt to lower the 1,600-mile non-stop record which they made one year ago in the snow, rain and mud, thereby earning for themselves and the car the name of the Jackson "Mud Hen." This year's trip will be three weeks later in the season, and the "Mud Hen" expects to encounter even worse weather than a year ago, when the drive was day and night to Bangor without stopping the engine once. The only stops again this time will be for the purpose of taking on oil and gasoline, and for food. A relay of newspaper representatives will accompany the car for the purpose of checking, and the route will take in Detroit, Toledo, Cleveland, Buffalo, Rochester, Albany, Springfield, Boston, Portland and Bangor. The car, which is a 40-horsepower Jackson, has for its ignition a U. & H. magneto and is equipped with Goodyear tires.

WHAT IS GOING ON AT SOUTH BEND

SOUTH BEND, IND., Nov. 15—The Studebaker Automobile Company, which has been doing quite a large business in electric vehicles, has decided that it will go into this branch of the work on a larger scale, and with that in mind has separated the electric from the other parts of the work and placed C. H. Tyler, formerly connected with the Chicago branch, in charge. The new idea is to take advantage of the experience gained, build cars in accordance with the dictates of this experience and place the whole matter on an independent footing, holding a department head responsible for the result. Mr. Tyler has taken hold of the work and is making every effort count in the production of electric vehicles. The headquarters of the company has been transfered from Cleveland, Ohio, to this city. Hayden Eames is in charge as general manager.

The addition which is being erected to the plant of the Simplex Motor Car Company, of Mishawaka, is nearing completion. The company is now turning out a car a day. The company has just finished three seven-passenger touring cars, which were shipped to Los Angeles.

Teagarden & Putt, of Goshen, have enlarged their salesroom and garage by the leasing of the first floor in the Kohler Block on North Main Street. They intend to add an electric charging plant and be able in a short time to do all kinds of repairing.

N. L. Otis, of this city, has just been appointed agent here for the Reo and the Rauch & Lang electric.

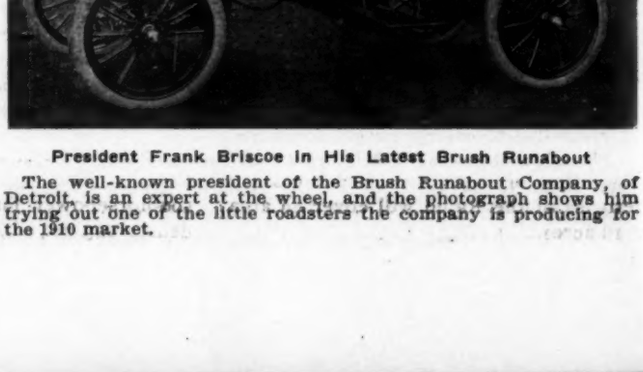
Charles G. Doriot, of Colombia City, has been appointed representative in that city for the Buick and Oakland, and expects to install a garage and salesroom in a short time.

The Oswald Motor Company, of Goshen, has increased its capital stock. The company recently took over the building which it now occupies, and is doing a thriving business.

"CARBURETER" SCHEBLER'S 12-CYLINDER

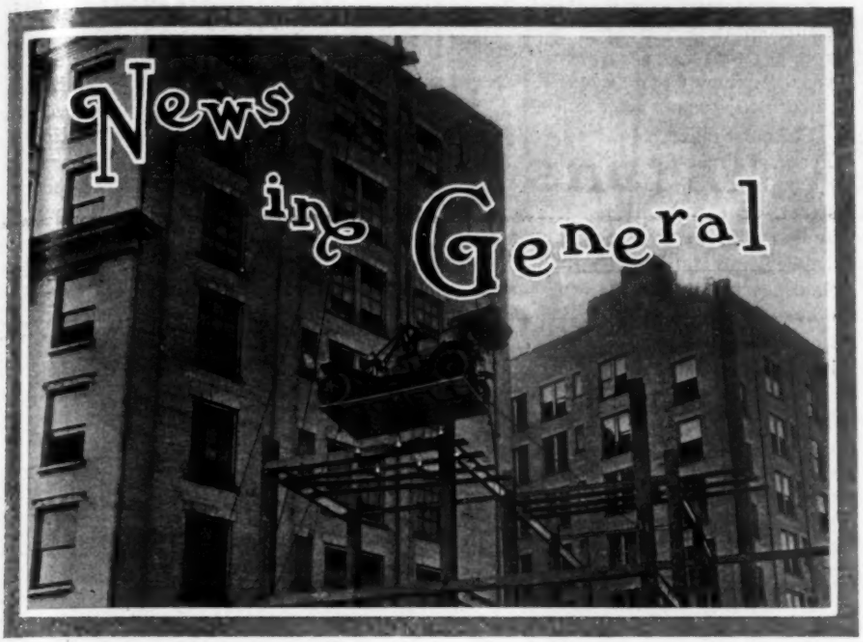
INDIANAPOLIS, IND., Nov. 15—After several months of experimenting, George Schebler, of the Wheeler-Schebler Company, has completed an automobile equipped with a twelve-cylinder motor. The cylinders are cast singly and are 3 1-2 by 4 inches. They are arranged at an angle of thirty degrees, six on a side. By an original coupling arrangement, six of the cylinders can be cut out or cut in without changing gears. The chassis is of the Marion type, with the exception of the motor.

Mr. Schebler has driven the car about 200 miles with satisfactory results. It is said to be especially powerful for hill climbing, but its speed has not been thoroughly tested. It is of about 75-horsepower. Mr. Schebler built the car merely to try out some ideas he has fostered for some time.



President Frank Briscoe in His Latest Brush Runabout

The well-known president of the Brush Runabout Company, of Detroit, is an expert at the wheel, and the photograph shows him trying out one of the little roadsters the company is producing for the 1910 market.



Mitchell, Official Pacemaker, Climbs an Atlanta Sky Scraper

Arriving in Atlanta ahead of the reliability run that blazed the national highway from New York City to the Gate City of the South, the Mitchell pacemaker, at the instance of its enterprising Southern representative, Robert C. Howard, was raised to the top of a building undergoing construction, and swung over Peachtree street, where during the Atlanta automobile show it was illuminated at night by a cluster of electric lights. The novel exhibit attracted the attention of thousands.

Lloyds Wouldn't Insure Pierce—It is the general impression that the organization of insurance men who are known both in New York and London as Lloyds will issue insurance of any kind. The New York Lloyds has been known to insure promoters against loss by rain on days set for outdoor contests, and everyone knows of the election insurances which they frequently make. The Pierce-Arrow Company now says that before the Glidden Tour this year it wrote to both the New York and London Lloyds asking if they would insure the Pierce-Arrows against losing the trophy. Two policies were proposed, one covering the winning of the trophies by Pierce-Arrow cars and the other that at least one of the four cars of that make entered would get a perfect score. Both the New York and London Lloyds decided it was a matter they did not care to handle.

Big Rapid Factory Additions—These are strenuous days around the big plant of the Rapid Motor Vehicle Company, at Pontiac, Mich. Large additions are in progress of erection, and an army of workmen are working day and night. The new buildings under construction are all of the Kahn system of reinforced concrete and will be modern in equipment in every detail. The additions to the plant consist of one building 640x60 feet, three stories high; two buildings 300x100 feet, each three stories high, and a power house 119x120 feet. With the completion of these new structures the factories of the Rapid will cover an area of 16 acres.

Liggett Buys Hatcher Company—The factory and plant of the Hatcher Auto-Parts Company, of Cleveland, has been purchased by the Liggett Spring & Axle Company, of Pittsburg. The specialties which have been manufactured by the Hatcher people will be continued at the Cleveland plant, and Wm. A. Cluff, who has been manager of the Hatcher works for the past five years, will remain in charge. In addition the Liggett Company will continue to turn out from its works at Monongahela, Pa., all types of high-grade automobile springs and axles. The company is also making roller bearings of an improved type.

Supplementary Spring Suit—The St. Louis Supplementary Spiral Spring Company, of St. Louis, has filed suit in the New York Circuit Court against the Supplementary Spiral Spring Company, 1876 Broadway, New York, for infringement of the Furmidge patent, No. 807,612, which the St. Louis company holds. The St. Louis company quotes in its favor the judgment rendered by the Patent Office October 30, 1909, on the interference between the application dated December 19, 1907, of J. H. Graham of the New York company, and the Furmidge patent.

New Power House for Kissel—The Kissel Motor Car Company, of Hartford, Wis., will on December 1 occupy its new power house, built to replace the structure destroyed by fire early in September. The equipment includes a 400-500-horsepower tandem compound condenser engine, with one 160-kw. and one 165-kw. direct-current generator. All machines and tools will be operated by individual motors. The power house is 44 x 30 feet in size and of reinforced concrete and brick construction.

Mutual Benefit Prospering—The Mutual Benefit Association of the Pope Mfg. Co., Hartford, Conn., recently elected W. J. Murray president, R. B. Wright vice-president, A. G. Hedstrom secretary and H. S. Seymour treasurer. R. B. Wright, J. H. Cudworth and P. Foley were elected auditors. Reports showed that the association has a membership in excess of three hundred and a balance of $1,594.75 in the treasury. During the past year the association paid out $769 in sick benefits to members.

What Would Have Happened if the motor of Count de Lambert's aeroplane had stopped when he made his remarkable flight from Juvisy to Paris and around the Eiffel Tower? Answer: He would have glided to the ground with perfect ease. Lavalette & Company asks the question, but seems to have overlooked the answer. That oversight, however, does not lessen the importance of the reliable ignition furnished Count de Lambert on his flight by the Eisemann magneto.

Rambler Output Is Conservative—In giving an estimate of their probable output for 1910, Thomas B. Jeffery & Company, Kenosha, Wis., makers of the Rambler, announce that they will build only 2,500 cars, a figure likely to cause some astonishment to those who are aware of the immensity of the Jeffery plant. The conservatism of the company's plans as far as quantity is concerned is officially stated, however, and the above number will represent the actual output.

Franklin Lumber Yards—To assure a supply of properly seasoned wood for the manufacture of the laminated wood chassis frames of the Franklin cars, the H. H. Franklin Mfg. Co. keeps in stock about 150 miles of lumber, some of which is kept as long as two years. A recent inventory showed 701,626 feet, sufficient for two years' consumption. The wood used is white ash, which comes from several districts in New York State and Pennsylvania.

Japanese Buys Baker Electric—During the recent visit of the Japanese Industrial Commission to Cleveland, the Hon. Sakutaro Satake, M. P., president of the Tokio Electric Light Company, inspected the plant of the Baker Motor Vehicle Company and finally placed an order for a Baker victoria for his personal use in Tokio. The car will be taken to Japan on the "Chiyo Maru," on which the commissioners will sail.

Some of Grabowsky's Orders—About a year ago the Acme White Lead and Color Works, of Detroit, Mich., pur-

chased a Grabowsky truck, which was found so satisfactory that it recently ordered another. The Stroh Brewery Company, of the same city, after using a Grabowsky for a few months, also obtained such good results that it purchased another.

Learning to Fly Aeroplanes—The Curtiss aeroplane belonging to A. P. Warner, of the Warner Instrument Company, has been at Beloit several days for practice flights. This is the machine that was on exhibition at Madison Square Garden, New York City, and at St. Louis recently. Mr. Warner has made several short flights and has attained a height of about 50 feet.

IN AND ABOUT THE AGENCIES

Palmer-Singer Agencies—Fred J. Titus, assistant sales manager of the Palmer & Singer Mfg. Co., is touring New England and New York in a 1910 Palmer-Singer 6-60, laying out agencies en route. The following have been established: The Holcomb Company, New Haven, Conn.; Mr. Livingston, of Hotchkiss & Livingston, Waterbury, Conn.; Andrews & Coleman, Providence, R. I., and Herbert Dike, Boston. Before starting a contract was made with Terry Brothers, of Glenridge, N. J., who will open a salesroom in Newark. Mr. Titus is on his way to Buffalo, N. Y., and will return by way of Binghamton.

American Truck and Hart-Kraft, Birmingham, Ala.—The Commercial Motor Truck Company, 738 Brown-Marx Building, has taken the agencies for the American truck and the Hart-Kraft delivery wagons for this district, handling commercial cars exclusively.

Oldsmobile and Oakland, Houston, Tex.—On November 1 the Houston Motor Car Company took over the representation for the Oldsmobile and Oakland. The Olds-Oakland Company will devote itself to the wholesale end of the business.

Great Western, Detroit—The Great Western Automobile Company, of Peru, Ind., opened a sales agency November 15 at 878 Woodward avenue, Detroit, under the name of the Great Western Automobile Company of Detroit.

Thomas, Lynn, Mass.—The E. R. Thomas Motor-Branch Company, of Boston, which distributes Thomas cars in New England, has contracted with C. E. Whitten to handle the cars in Lynn.

Parry, St. Louis—The Petrie-Phillips Automobile Company, which has been appointed local agent for the Parry Automobile Company, of Indianaoplis, has opened a salesroom at 1127 Olive street.

Overland, Brooklyn, N. Y.—C. I. Silver has been appointed agent for the Overland and until his new building is completed will be at 71 Flatbush avenue.

Continental Tires, Portland, Ore.—The Continental Caoutchouc Company announces that it has appointed the Goodyear Rubber Company agent for Continental tires and rims in that district.

Palmer-Singer, Newark, N. J.—R. M. Terry, Palmer-Singer agent in Newark, has taken a long lease on 38 William street, at the corner of Halsey, where he is occupying a large fireproof building.

Overland, Atlanta, Ga.—The Overland Southern Automobile Company has moved into its new quarters in the Peachtree Auditorium Garage, where it has accommodations for 150 cars.

Apperson, Atlanta, Ga.—Alfred Austell has been appointed Apperson agent in this city and will open a garage and salesroom on Auburn avenue shortly.

Ford, Portland, Ore.—The Standard Motor Car Company, of 86 Tenth street, has been organized here to look after the interests of the Ford car.

Isotta, Los Angeles, Cal.—The Motor Car Import Company has been organized to take the Southern California agency for the Isotta cars.

PERSONAL TRADE MENTION

John Gillespie, who has just been elected secretary of the Detroit Motor Club, will be remembered by participants in the Glidden Tour last summer as the secretary of the Detroit Automobile Dealers' Association. He was largely responsible for the excellent arrangements provided in Detroit for the reception of the visitors and the successful start of the tour.

Will Soules, the well-known driver, who formerly piloted Pope-Toledo racers, is now in charge of the testing department of the Croxton-Keeton Motor Company, at Massillon, O.

Charles Waterman, formerly with the Maxwell-Briscoe Company at New Castle, Ind., has been appointed superintendent of the Southern Motor Works, at Jackson, Tenn.

FRAYER-MILLER DEVELOPMENTS

COLUMBUS, O., Nov. 13—Columbus stockholders in the Oscar Lear Automobile Company, of Springfield, O., have received word that E. S. Kelly, of Springfield, has purchased a controlling interest in the concern and will reorganize it with a capital of $500,000. Recently the General Motors Company bought the holdings of William Miller, of Columbus. Mr. Kelly purchased this block and also that of Oscar Lear, giving him control. Charles L. Bauer, at present receiver of the company, will be made general manager after the reorganization. The company now manufactures commercial vehicles exclusively.

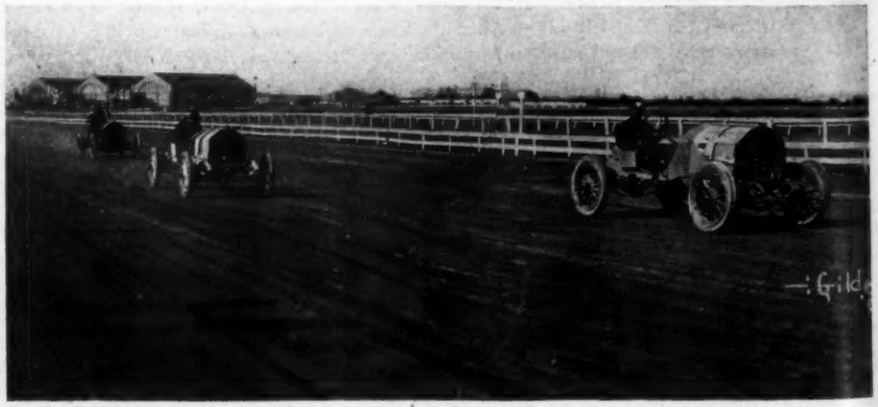
OBITUARY

George William Hoffman, the well-known manufacturer of U. S. Metal Polish and other specialties, died at his home in Indianapolis on Friday, October 22, after a brief illness. The business will henceforth be managed by his widow, Mrs. Hoffman, without change in policy.

RECENT TRADE PUBLICATIONS

The Metz Company, Waltham, Mass.—This company has adopted the policy of selling all the necessary component parts of an automobile, with full instructions, thereby allowing the buyer to save the expense of having them assembled at the factory. Also the buyer acquires a knowledge of his car, by assembling it himself, that is likely to prove of material aid to him. The Metz catalog consists of eleven loose sheets in an artistic cover, describing the car and explaining the Metz idea of construction. Men of any mechanical talent will find much in it to interest them, and even those of no pretensions in this line may take heart on the reading of it.

The Electric Storage Battery Company, Philadelphia—This pamphlet hardly comes under the head of a catalog, as it makes no claims for the "Exide" batteries manufactured by the company which brings it out. Rather it should rate as a book of instruction on the care of storage batteries of whatever kind. The text is from a paper read by H. M. Beck, an engineer of the Electric Storage Battery Company, at the meeting of the Society of Automobile Engineers, August, 1909. The principles of the chemical and electrical action in a storage battery, and the use, care and troubles of such batteries are concisely set forth in the compass of seven closely printed pages.

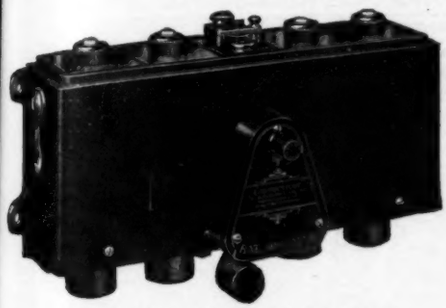


DeHymel, in Stoddard-Dayton, Winning Five-Mile Texas State Championship

At the recent Texas State Fair, at Dallas, the Stoddard-Dayton, entered by the Alamo Auto Company, of that city, and driven by DeHymel, scored a notable victory in the five-mile State championship, beating out two noted competitors. The car also established a new State record for the track mile of :51 3-5.

Information for Auto Users

New Connecticut Coils—The Connecticut Telephone & Electric Company, of Meriden, Conn., has brought out for 1910 an entirely new model of spark coil with master vibrator, a departure from its previous practice. With the ordinary type of coil, each unit of which has its own vibrator, it is necessary to adjust



CONNECTICUT MASTER VIBRATOR COIL

each separately—an operation which takes no mean degree of skill, if creditable results are to be obtained. Take for example a four-cylinder engine with this type of coil. The vibrator of No. 1 cylinder may be adjusted to draw one-half ampere, firing that cylinder exactly on dead center; No. 2 coil may be taking one ampere, with the result that its cylinder is firing two or three degrees past center; No. 3 may be taking two or three amperes, and firing five or ten degrees beyond the center; No. 4 may be taking one-quarter ampere, and firing before center. Naturally the performance of the engine is poor.

CONNECTICUT SPARK COIL, TYPE X

This state of affairs is impossible in the master-vibrator type, as the single vibrator acts for all the coils. Each coil unit must draw exactly the same amount of current, and fire its cylinder at exactly the same point. It is said that the difference in the running of the engine can often be detected by the ear.

The Connecticut master-vibrator coil is made on the unit-coil principle, licensed by the Unit Coil Company, and each coil has a cut-out button for testing purposes. Each unit also has a patented shield which prevents induction between coils.

Another new Connecticut model is the "Type X," of the ordinary design, intended to fill the demand for a less expensive coil than the regular Connecticut makes. It is considerably smaller than the standard coil, though built on the unit system, and sells at a very reasonable price.

1910 Banker Wind Shields—Four different styles of shields will be made by the Banker Wind Shield Company, of Pittsburg, during the coming season, and these will present no radical changes. They will be known as types 1, 2, 4 and 5. Type 1 is a single glass, fitted into a 3-8-inch channel in a 7-8-inch 16-gauge brass tube frame. No. 2 is of the divided

BANKER DOUBLE-FOLD SHIELD, NO. 2

folding variety. The proportions are such that when the upper half is folded down the entire shield is below the driver's line of vision. When not in use the entire shield folds down forward over the hood.

No. 4 is made in response to the demand for a low-priced shield. Workmanship and material are of the same grade as in the others, but the construction is simplified by attaching the lower

HINGE USED ON 1910 BANKER WIND SHIELDS

half rigidly to the dash, only the upper half being hinged. By doing away with the side arms and brackets and the telescoping rods the price is reduced.

No. 5 shield is made expressly for racing-type runabouts, in which the front seat is set further back from the dash than usual. In such cases the ordinary design of shield is often practically useless. No. 5 has its lower half attached to the dash at an angle of 60 degrees, bringing the upper half back into a useful position.

"All-in-One" Spark Plug—This plug has all the features of the usual plug, with the addition of a compression-relief and priming cup. With the approach of cold weather the latter becomes especially valuable, for many engines which start with difficulty in cold weather may be aroused by pouring a few drops of gasoline directly into the cylinder. The "All-in-One" spark plug provides the priming cup, when one is not regularly fitted to each cylinder; and the cup in connection with the spark plug has the additional merit that the gasoline is introduced into the most favorable place, and nearest to the spark. The maker, the Comet Electrical Mfg. Co., claims that by first priming the cylinders, any engine will start on a single turn of the crank in almost arctic temperatures.

"ALL-IN-ONE" SPARK PLUG

The combination of spark plug and compression-relief provides an easy method of cleaning the plug without removing it. The relief opening communicates with the space around the insulation of the plug, so that if the cocks are opened while the engine is running all soot and dirt is blown off the plug. These plugs are sold only by mail.

H. & C. Tire Inflator—"Let the engine do the work," says the H. & C. Tire Inflator Company, of Dayton, O. The device made by this company is intended to provide a simple means whereby tires may be inflated by utilizing the burnt gases in one of the engine cylinders.

H. & C. TIRE INFLATOR

These gases, for the most part carbon dioxide and nitrogen, are not injurious to rubber. The device consists mainly of a suitable filter, which cools off the gas and prevents oil and other unsuitable substances from entering the tire. As the gases are delivered cool, the tire need only be inflated by the desired pressure, as shown by the indicator, there being no cooling off and consequent reduction of pressure after completion.

The filter has a body formed from a piece of brass tubing 2⅝ by 10½ inches, with brass cap ends; it carries the pressure gauge and shut-off valve. A check valve, to be screwed into one cylinder in place of the compression cock, is connected to this filter by copper tubing.

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